A Hitchcock Publication

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JULY 1950

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* New Design

LONG TIME NO SAW

Long time since Indian sell cigars. Him now outmoded like most woodcutting saws on market. Many moons ago neon signs replace oaken Indian. But not until Big Four develop N.D.* saw has anything been done to improve old-fashioned saw blades.

Now, Big Four brings you the *first* revolutionary change in saw blade manufacture in 150 years. It's non-tensioned! It's true running! It's smooth cutting! It's distortion proof! It's NEW DESIGN from the arbor hole to the carbide tip and it's made only by Big Four.

N.D.* saws have a heavy body which eliminates stiffening collars. Blades run true and cut clean for *your* job specifications determine fin length. Every tooth does its share for fin is held to minimum length. Teeth are milled, too, (not stamped) from tempered steel plates . . . are free from internal strains. Kerf is precision fitted . . . designed for *your* job.

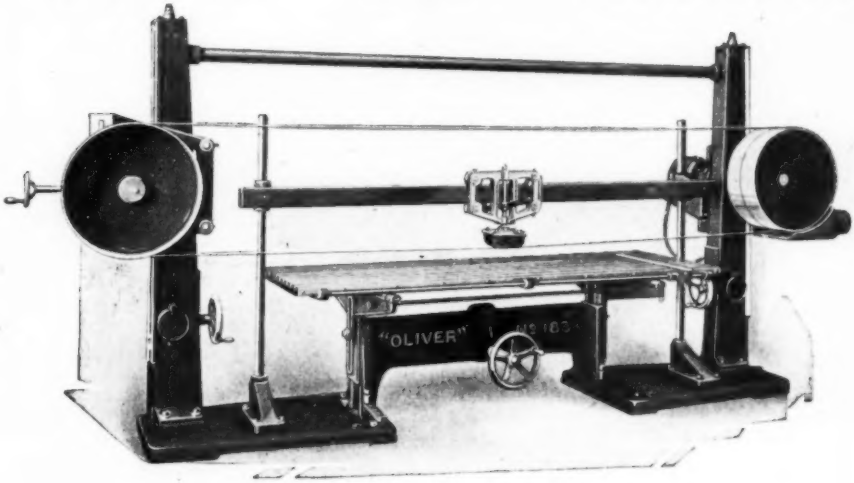
So take a good look at your saws and their production records. Remember that medicine men at Big Four's Cincinnati plant have the remedy for your sawing problems if you find your blades, like the woe-begone redskin, are relics of the past. Big Four blades make heap big difference in scrap heap, too!

BIG 4 CARBIDE TOOL CO.

BIG FOUR CARBIDE TOOL COMPANY

5938 CARTHAGE AVENUE • CINCINNATI 12, OHIO

"OLIVER" BELT SANDERS



No. 183 Reversible BELT SANDER

1. A Moulding Sander
2. A fine Flat Sander

With pulleys up it's an excellent Flat Sander; with pulleys down a valuable Moulding Sander. It rapidly sands and polishes line edge mouldings, straight, flat and irregular surfaces. Ideal for sanding and finishing built-up pieces of furniture of small and medium size. Has unlimited usefulness in the small shop as well as the large production plant.

This "Oliver" Belt Sander is illustrated with semi-automatic sanding attachment. Power stand has motor mounted directly on main slide. Pulleys and table adjustable vertically. Idler pulley also adjustable horizontally. Table rolls on ball bearings.

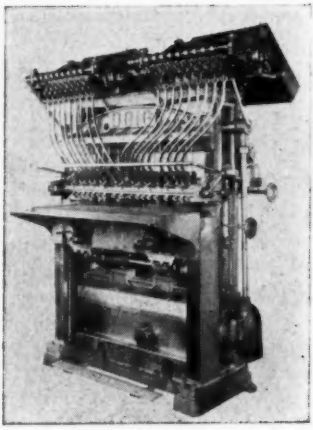
For details
Write for illustrated bulletin
No. 183D

OLIVER

OLIVER MACHINERY COMPANY
Established 1890 **GRAND RAPIDS 2, MICHIGAN**

They're off

AT PRODUCTION PARK
BET ON A WINNER



DOIG No. 45-26-18
Track. Combination
Open Nailing,
Cleating Machine

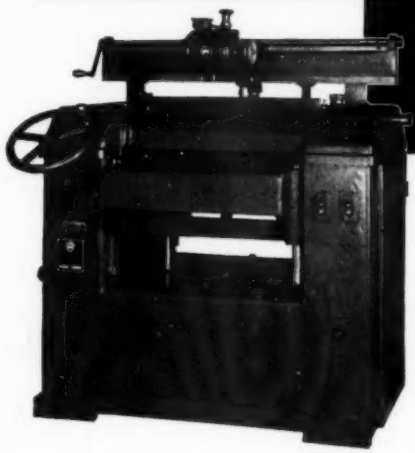
DOIG AUTOMATIC NAILERS

When your jobs go to the post, do you consider all of the entries in the production race . . . do you know about a real production thoroughbred, the DOIG automatic nailing machine? It's built for speed and assures you of a winner for neatness and workmanship everytime. Why not inquire about this effective time-saver?

WRITE TODAY . . . we invite your requests for full details

WILLIAM S. DOIG Inc.
DEPT. 312 — 55 FRANKLIN ST., BROOKLYN 22, N.Y.

DIVIDEND DESIGN gives the PORTER 405 SURFACER 5 Big Advantages



- HIGHER SPEED OPERATION
- PREMIUM CAPACITY
- FASTER ADJUSTMENT
- EASIER OPERATION
- LONGER LIFE

Because of Dividend Design, a Porter 405 Surfacer will handle more lumber at lower cost than ordinary machines. Its extra margin of speed, capacity and strength produces heavier cuts, smoother work and a more profitable operation.

DIVIDEND DESIGN makes the Porter 405 Surfacer extra fast for surfacing at higher speeds. A matched "V" belt drive rotates the cutterhead at 6,000 RPM to assure clean, smooth, perfect work. This high speed is made practical by the newly designed chipbreaker which keeps the machine running free at all times.

DIVIDEND DESIGN permits heavier cuts on a Porter 405 Surfacer. Free and easy cutting action makes possible the use of an increased blade angle without increasing the size of the motor. This means greater surfacing capacity with no rise in power costs.

DIVIDEND DESIGN simplifies adjustment of a Porter Surfacer. The operator quickly varies the rate of feed even as the lumber moves through the machine.

DIVIDEND DESIGN makes it easier to surface pieces of many different sizes and shapes. Individual magnetic controls prevent operation of the feed unless the cylinder is running. All rolls are power driven.

DIVIDEND DESIGN prolongs the life of a Porter Surfacer. It has the extra strength and extreme rigidity of welded steel, ribbed construction. This provides a durability achieved only with excessive weight with cast iron.

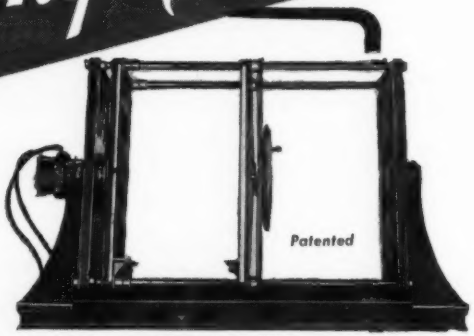
Write today for complete information on the advantages of Porter **DIVIDEND DESIGNED** *machinery*

C. O. PORTER Machinery Co.

668 Front Ave., N. W. Grand Rapids 4, Michigan

Lancaster Clamping Machines

Steel collars that equalize pressure, welded steel base, roller bearings, adjustable aluminum case supports — equipped with locking device, adjustable balancing weight—to assure equal distribution of weight and effortless revolving, air control on each side of machine. GUARANTEED TO CLAMP SQUARE.



No. 1100-C Air Operated Revolving Case Clamping Machine

The fastest and most accurate method ever devised for clamping up case ends and frame assemblies. Several prominent manufacturers have from 8 to 14 of these machines in operation.

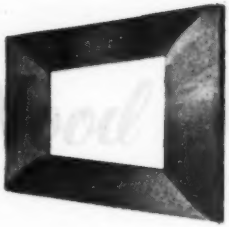
No. 100-C Automatic Two Way Air Operated Case End and Frame Clamping Machine

Patented

J.M. LANCASTER
INC.
HIGH POINT, N. C.

HEADQUARTERS FOR AIR-OPERATED CLAMPING MACHINES FOR FURNITURE

WRITE FOR DETAILS



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ASSURE HIGH SPEED PRODUCTION

BIG CHIEF

The most dependable knife for general purpose high production work.

KNIFE SPECIALISTS SINCE 1891

MOHAWK

Can withstand hard knots in Southern and similar soft woods.

THE **WAPAKONETA**
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WAPAKONETA, OHIO

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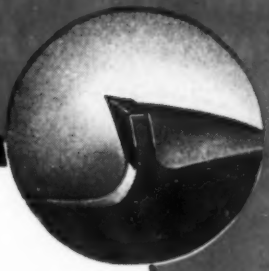

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Carbide

TIPPED SAWS

IT'S THE TIP THAT COUNTS

LOOK FOR THIS EMBLEM ON EVERY SAW BLADE

for ALL YOUR SAWING OPERATIONS

When you use *"Long Life"* Carbide Tipped Saws you save time and money by having **LESS DOWN TIME** on your machines, you get **SMOOTHER CUTTING** and add to the profits of your operations by having **LOWER SHARPENING COSTS.**

Write For Full Information Today

LONG LIFE Carbide TIPPED SAWS Saw & Tool Co.

Phone WEbster 9-6480

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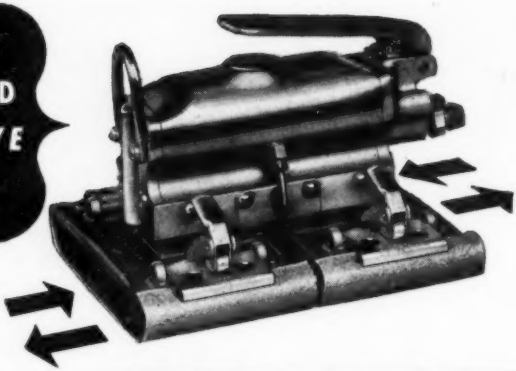
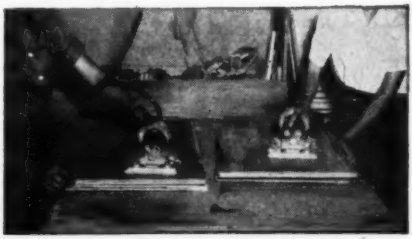
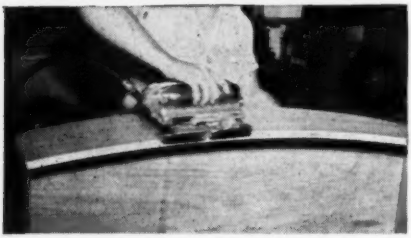
A FEW REASONS WHY SUNDSTRAND SANDERS *IMPROVE* WOOD FINISHING



Here's a Sander that will improve the final finish in your woodworking operations. Use it for white sanding, wash coat sanding, sealer sanding, rubbing lacquer finish and padding in filler. The pads of this outstanding Sander reciprocate in a straight line and opposite directions. Vibration is reduced and operator's fatigue minimized. Here are three of its many features:





1. *Allows Sanding in Small Corners*

Pad design allows sanding up to sharp corners — extremely important for obtaining complete and fine finish on assembled pieces.

2. *Sands Curved Surfaces*

Curved surfaces such as drawer fronts are easily handled by Sundstrand Sanders because of the elasticity of pad design.

3. *Easy To Handle*

Women operators can easily handle a full day's work with Sundstrand Sanders without undue fatigue.

FREE DATA

Write for complete information on wood finishing and sander details. Ask for bulletins W-55.

SUNDSTRAND MACHINE TOOL CO.
PNEUMATIC MACHINE DIVISION
ROCKFORD, ILLINOIS, U.S.A.

More Footage From J&O Heads and Every Foot True to Pattern!

JONES & ORTH H-Type Cutter Heads allow perfect take-up for wear without change of cutting angle!

Long runs or short runs — you never have to apologize for variations from your patterns when you use JONES & ORTH H-Type Cutter Heads. Patented holder permits knife to be moved forward as it wears down, *with unchanged cutting angle.* Knives usable right down to the last fraction of an inch, with no change of pattern! *Quick service* on standard or special patterns! Ask your dealer, or write our nearest branch!

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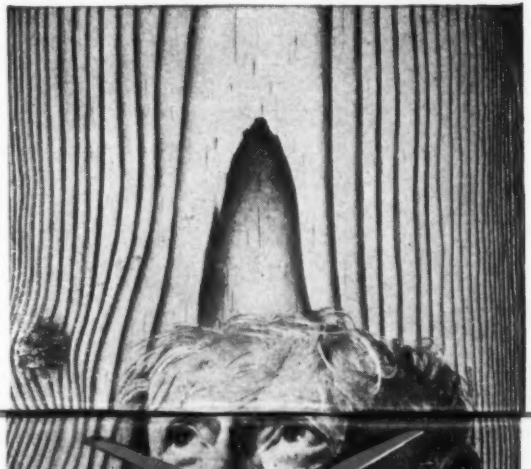
BOX 3064, SEATTLE 14, WASH.

ONE OF 12 WOOD-LOK* FEATURES

PERMITS COOL WORKING CONDITIONS

WOOD-LOK is a liquid, resin glue that comes ready-for-use COLD!

WOOD-LOK – a cold-run glue for joint assembly operations brings welcome relief to woodworking shops in summertime. It is used at room temperature. It permits the shop temperature to be regulated for the comfort of the workman – *not to pamper the wood or the glue!* Windows can be kept open . . . steam coils can be shut off . . . and a healthy, comfortable ventilation can be maintained to help keep workmen on the job.



WOOD-LOK comes to you ready for use. Nothing has to be added, soaked or heated. WOOD-LOK will not congeal too rapidly

or the glue! Windows can be kept open . . . steam coils can be shut off . . . and a healthy, comfortable ventilation can be maintained to help keep workmen on the job.

WOOD-LOK comes to you ready for use. Nothing has to be added, soaked or heated. WOOD-LOK will not congeal too rapidly on cold wood. It sets quickly and uniformly at any normal temperature. WOOD-LOK stays resilient. Humidity changes do not cause it to form a brittle, easily-shattered bond. WOOD-LOK has a storage and working life of months – not 3 to 4 hours. It remains in liquid form without the use of ice pans. It provides a setting speed comparable with hot animal glues. It can be handled after a clamping time of only 20 to 30 minutes – instead of 6 to 8 hours.

WOOD-LOK is available – NOW! *Address:* 270 Madison Avenue, NEW YORK 16; 3641 So. Washtenaw Ave., CHICAGO 32; 735 Battery St., SAN FRANCISCO 11; and other principal cities. In CANADA: National Adhesives (Canada) Ltd. TORONTO and MONTREAL. In ENGLAND: National Adhesives, Ltd., SLOUGH. (*Reg. trade mark)

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EVERY TYPE OF ADHESIVE FOR EVERY INDUSTRIAL USE

Every Year

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WHITNEY No. 97 DOUBLE SURFACER

More production per operator — smoother planing — accuracy — faster feeds — trouble-free service and lower planing costs — that's what woodworking and furniture people are looking for in planing equipment today. The Whitney No. 97 Double Surfacer meets these requirements as testified by hundreds of satisfied owners. The Whitney No. 97 can produce for YOU as it is doing in so many plants today. Write for full particulars.

Features **• Micro-feed Selector — any feed at touch of handwheel • Whitney Automatic, Self-reversing Knife Grinder • Automatic Motor Brakes • Ball and Roller Bearings thruout • Finger-tip Controls • Safe, Convenient Operation**

Feeds: **30 to 90 feet per minute. Planes stock: 1/16" to 7" thick. Sizes: 30", 36", 40" and 44" widths.**

Planing Specialists for more than 100 years

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WINCHENDON, MASSACHUSETTS, U. S. A.

Planers • Shapers • Variety Saws • Mortisers • Back Knife Lathes

6" JOINTER Dual purpose guard enables operator to plane stock ribbon thin or in narrow strips with absolute safety: cutter-head of solid steel, ground and dynamically balanced, three knife, approved safety type, 2½" diameter. Rear knife guard keeps knives covered always. Overall dimensions: height floor to table 34½", length 42½".

2 SPEED, VERTICAL SPINDLE SHAPER Cutter spindles are interchangeable and fully protected by adjustable guards. Two speeds: 7000 and 11,000 r.p.m. Spindle 17" long, journaled on two pre-loaded ball bearings. Guides quickly adjusted or easily removed. For heavy duty operation, such as making up samples.

More than wide selection

in woodworking machines

One reason you see the Walker-Turner nameplate so often in machine rooms is the wide range of equipment Walker-Turner builds. As you will note from the illustrations on these pages, there is a Walker-Turner machine to meet practically any woodworking requirement.

But there is another reason valued by management as much as the completeness of line, since it affects even more directly plant operating costs and profits. It is Walker-Turner *design*—correctness of design. These machines are planned and engineered with the specific needs of the job in mind.

New 12" TILTING ARBOR SAW Capacity 4½". Table 48" wide x 38¾" deep. 5 h.p. 3 phase motor or 3 h.p. single phase. Dado capacity 1½" wide. Saw speed 3600 r.p.m. New rip fence locks front and rear, micrometer adjustment "T" slots for miter gauge. New improved safety guard and splitter. Exclusive "Synchro Belt Drive."

New 16" BAND SAW Big capacity—16" blade, 18" x 17" table. Every basic part is completely functional. Fast, accurate, safe, and easy to operate. Saves time and labor.

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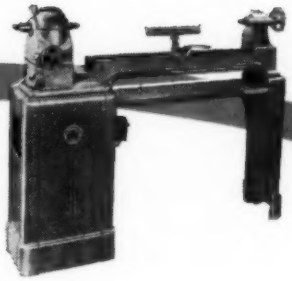
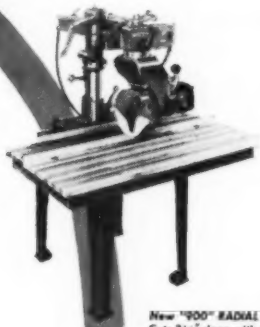


VARIABLE SPEED LATHE Combines best principles of lathe design with massive construction and finest precision. Range up to 2600 r.p.m. with a 1740 r.p.m. motor. Speed of spindle shown on a graduated scale in full view of operator. Variable speed drive and motor mounted inside heavy cast iron pedestal, protected from dust and chips.



it's Walker-Turner design

that cuts operating costs!

That is why Walker-Turner machines stand up better in the woodworking plant . . . why more and more mill operators are turning to Walker-Turner design for more efficient make-up of samples. For the Jointer, Spindle Shaper, Lathe or Band Saw that's tailored for the job is, first of all, a *cost-cutting* machine.

See the complete line at your Walker-Turner Dealer's. Let him show you how these woodworking machines can save money in your plant. Or mail coupon for catalog.

SOLD ONLY THROUGH AUTHORIZED DEALERS

New "900" RADIAL SAW
Cuts 3½" deep with a 9" blade—more than most machines with a 14" blade. Greater capacity with smaller blades (which require less power) and more rim force at the saw tooth, resulting in higher cutting efficiency. Does 14 different operations. Full work visibility.

15" DRILL PRESS
For fast production drilling operation. 4 Speeds—600, 1250, 2440, 5000 r.p.m. with 1740 r.p.m. motor. One piece head casting, completely machined in one setting for greater accuracy. Spindle travel 4½". Chuck to table 18½".

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WALKER-TURNER DIVISION
PLAINFIELD, NEW JERSEY

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Walker-Turner Division, Kearney & Trecker Corp.
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Special blade can be used to cut any kind of metal.
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Sold and Serviced throughout the World.

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20" THICKNESS PLANER

The Parks No. 20

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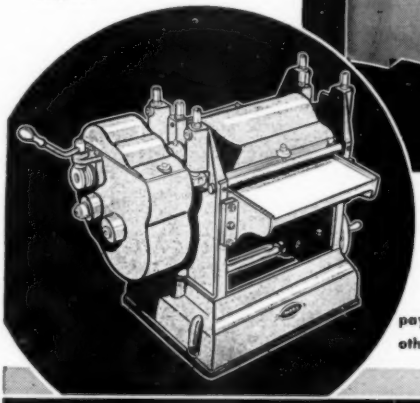

12" THICKNESS PLANER

A compact, sturdy machine that offers mill planer precision and ruggedness at a sensationally low price. A real heavy-duty 12" x 4" planer that can pay for itself in savings effected through the salvage of otherwise waste stock. Write for descriptive catalog sheet.

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Manufacturers of Quality Woodworking Machines Since 1887

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17" Floor-Model Drill Press $165.00

You get top accuracy at low cost in a wide range of capacities

Delta®

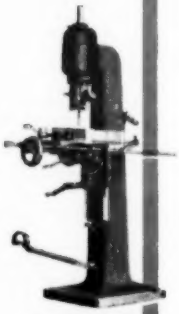
...the most complete drill press line

TALK about selection! There are 144 different Delta drill presses, and Delta application in 42 other machines besides drill presses.

...the most complete drill press line

14" Floor-Model Drill Press
$84.00

14" Bench-Model Drill Press
$74.00



Crescent Mortiser
$544.50*

Motor and switch extra.
Prices subject to change without notice.
*Plus zone delivery charge

17" Bench-Model Drill Press
$204.50

TALK about selection! There are 144 different drill presses in the big Delta line. Every one is tops when it comes to drilling — and versatile enough to do over 36 different additional jobs, besides!

Naturally you can find the exact machine your job calls for in such a complete line — with the right chuck capacity, the right speed — *and at such low cost!*

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What's more, you get this *same* wide selection in 42 other machines besides drill presses. Altogether, they make *Delta* the industry's most complete line of woodworking and metalworking machines. It's the only line with complete accessories to make every tool do more jobs — and often save you an investment in other machines.

That's why it pays to look to Delta first — for the right machine to do your job right. Send coupon for catalogs and bulletins on the entire Delta line.

DELTA POWER TOOL DIVISION

Rockwell
Manufacturing Company
MILWAUKEE 1, WISCONSIN

DELTA • MULTIPLEX • CRESCENT • HOMECRAFT

Sold only through authorized dealers. Easy time-payments available. Look for the name of your Delta dealer under "Tools" in the classified section of your telephone directory.

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a complete selection of:

3 Band Saws | Scroll Saw | 4 Jointers | 6 Circular Saws

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53 Machines — 246 Varieties

1300 Accessories

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ROCKWELL MANUFACTURING CO.
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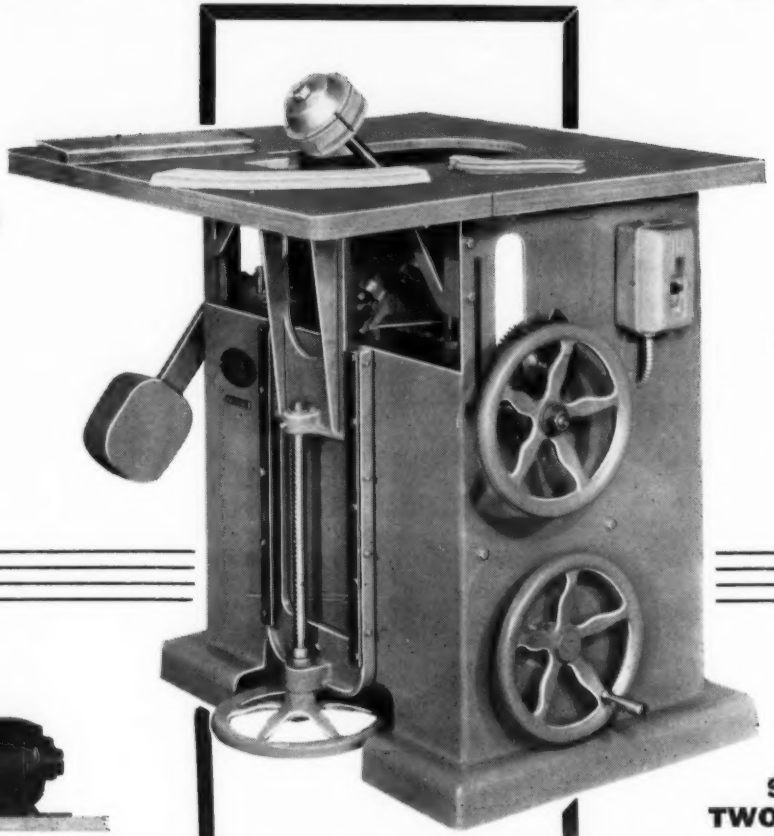
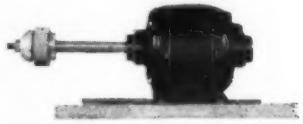
W-57

PEARSON *Versatile* MODEL A SANDER

America's FASTEST AND MOST EFFICIENT SANDER for IRREGULAR SHAPES



With BELT SANDER ATTACHMENT an ideal ALL-PURPOSE SANDER



SAVES ONE OR TWO OPERATIONS

MOTOR IN HORIZONTAL

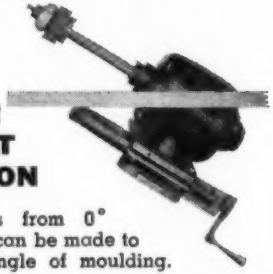
5 DAYS

By permitting motor shaft to tilt until sanding head angle perfectly fits

SAVES ONE OR TWO OPERATIONS

MOTOR IN HORIZONTAL POSITION

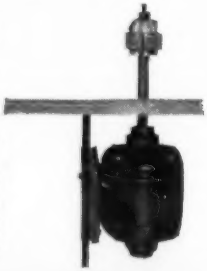
5½ inch head can be raised 2 inches above table level. Table can be lowered 2 inches to give 4 inch clearance.



MOTOR IN TILT POSITION

Tilt ranges from 0° to 90° and can be made to fit exact angle of moulding.

MOTOR IN VERTICAL POSITION



Motor can be raised 6 inches on motor base. Whole motor unit can be raised 9 inches additional, or 15 inches in all.

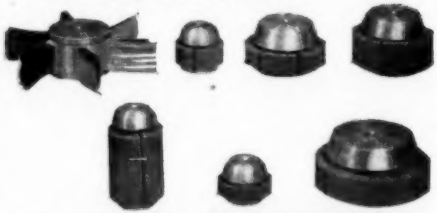
5 DAYS FREE TRIAL

We are so thoroughly convinced of the efficiency and economy of our machine that we do not hesitate to offer it for sale with the understanding that if it does not reduce your previous sanding costs sufficiently to justify the purchase of the machine, we will accept its return at no cost to you.

By permitting motor shaft to tilt until sanding head angle perfectly fits beveled moulding angle, this machine cuts and polishes one or more step-downs at the same time. Furthermore, the rubber cushions hold their shape many times longer than felt.

SAVES 60% TO 80% IN SANDCLOTH

For instance, one strip 1"x17" (17 sq. in.) on this machine will do more sanding and last longer than one square 8"x8" (64 sq. in.) cut into a disk, hole punched, slit and tucked into place around an old type cushion. The saving on sandcloth alone oftentimes pays the cost of a Pearson Model A.



7 HEADS - 14 CUSHIONS

Are standard equipment with each machine. Length of cushion ranges from ¾ inch to 4 inches. Outside diameter ranges from 3¼ inches to 7 inches.

PEARSON SANDING MACHINE CO., INC.

HIGH POINT, N. C.

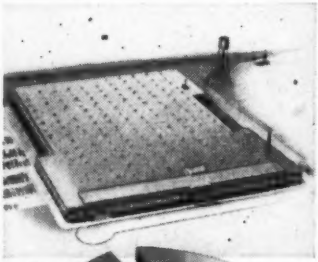
ALSO MANUFACTURERS OF WATERFALL BELT SANDERS, BLOCK AND EDGE SANDERS, AND GRILL SANDERS.

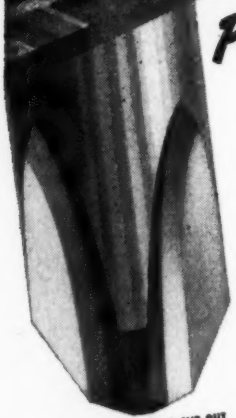
PRODUCTION CURVES ARE RISING...

...at AMERICAN'S New Plant at WILLIMANTIC

Acres of the newest and fastest automatic machines are steadily boosting the production curves of both American Phillips and Slotted Fasteners . . . and the quality curve, as well.

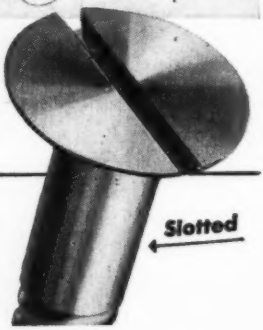
This modern, streamlined plant will soon be one of the top-production units of the screw industry . . . deliveries expedited by national distribution which is now geared up to greater efficiency than ever before. Willimantic production and shipments will be supplemented by our Norristown, Pa., plant and Chicago, Ill., warehouse.





4-WINGED DRIVER CAN'T SLIP OUT OF PHILLIPS TAPERED RECESS

Phillips



Slotted

AMERICAN SCREW COMPANY

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Warehouses at:

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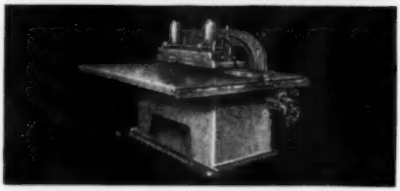
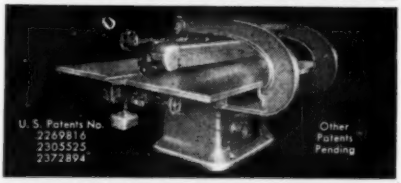
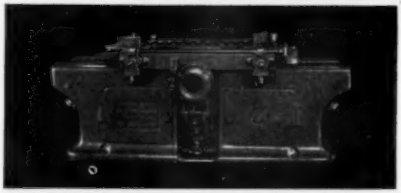
AMERICAN SCREWS

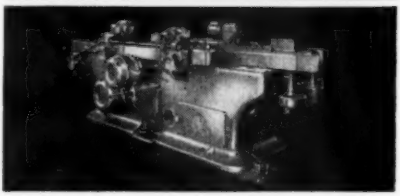
COST-WISE WOODWORKERS KNOW

THE DEPENDABLE Diehl LINE









If you make
veneer . . . plywood . . . mouldings
fine furniture . . . dimension

Call in your Diehl representative for facts and figures on the savings made with these and other Diehl woodworking machines. Ask him for specifications on the machines to fit your requirements—or write the factory.

Diehl-Vonnegut Moulder (upper left)—This is the famous 6" and 8", 4-head all-purpose Diehl-Vonnegut, with the vibrationless, trouble-free spindle, found only in Diehl-Vonnegut Moulders. Other sizes range up to 12", both four- and five-head models.

No. 750 Rip Saw—The unequaled rip saw for precision cutting and sawing of open end or hollow glue joints at up to 250 feet per minute. Handles stock from ⅛" up to 4¼", any length. Companion models include the Model 55, and the Junior size, Model 33.

No. 890 Tapeless Veneer Splicer—This fast, economical method of edge joining veneers, without the use of tape, in a neat, invisible splice, is an exclusive Diehl process. Little or no sanding necessary. Speeds up to 85′ per minute.

No. 660 Jointer and Edge Moulder—A double-purpose machine, with only a few minutes change-over required from cutting glue joints to cutting edge mouldings. Workmanship is unsurpassed. Speeds up to 100′ per minute.

No. 69 Veneer Jointer and Edge Gluer—Clean, sharp, straight joints, permitting perfect splices, plus the application of glues in the same operation, are yours with the G. M. Diehl Model No. 69. Precision accuracy up to 50′ a minute with mixed widths of veneer strip in bundles up to 2" thick.

Also: Edge Gluing Machines, Cutters and Cutterheads, Cutter Grinders, Cut-off Saws, Saw Sets, Glue Pots and Conveyors.

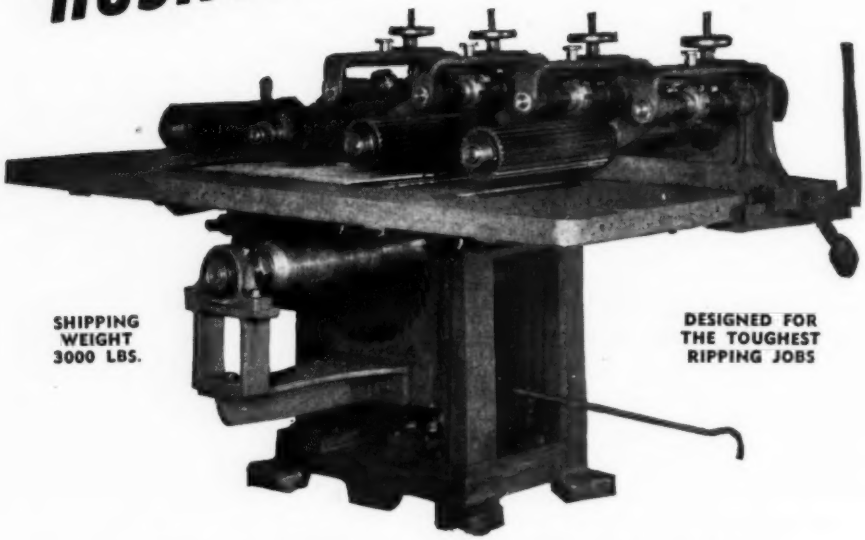
THE G. M. Diehl MACHINE WORKS, INC.

On the Banks of the Wabash

WABASH, INDIANA • U. S. A.

A REAL HUSKY. . .

NO. 213 HOOSIER SELF FEED RIP SAW



SHIPPING WEIGHT 3000 LBS.

DESIGNED FOR THE TOUGHEST RIPPING JOBS

FOR QUICK OPERATION - DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H. P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs.

Available for direct motor, V belt or flat belt drive.

SINKER-DAVIS *Company*

230-250 SOUTH MISSOURI ST. DEPT. 0 INDIANAPOLIS, INDIANA

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Your Production! Raise the Quality of Your Planing!

No. 380-A
PLANER

THE PRECISION PLANER

There is NO SUBSTITUTE for Quality! Price alone is never a true gauge of value. Power Planers offer PREMIUM VALUES at standard prices. Eighty-three years of quality manufacturing back our claim to PRECISION WORKMANSHIP. Thousands of satisfied users are our best advertising. The Model 380 Planer is modern—rugged—compact—safe—but, most of all, it's TOPS IN PLANING.

HIGHEST QUALITY SINCE 1867

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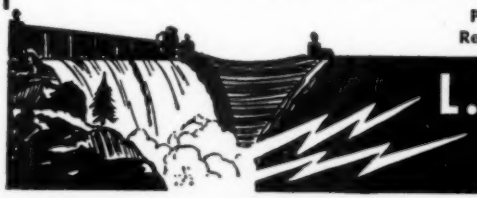

L. POWER & CO.
2823 Oakford St.
Philadelphia, Pa.

LONG-LIVED MORTISING AND BORING TOOLS

For long life specify GREENLEE Tools. Famous for fine cutting edges, accurate sizing, correct form, proper heat-treating. Get more production per tool dollar invested . . . save sharpening and repairing time. Get GREENLEE.

FREE BORING CHART for wood screws with specifications to simplify bit or drill selection. Write today to Greenlee Tool Co., Division of Greenlee Bros. & Co., 2137 Herbert Avenue, Rockford, Illinois, U.S.A.

TOOLS FOR CRAFTSMEN

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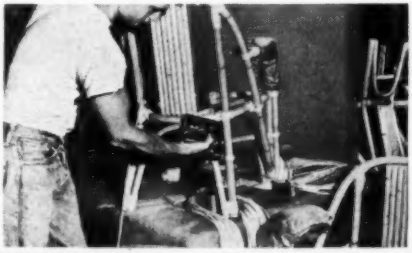
MULTI-SPUR BITS • ROUTING BITS • COUNTERSINKS • PLUG CUTTERS • DRILLS

Tested Short Cuts That Cut Fastening Costs

It will pay you to join the fast-growing group of furniture makers and woodworkers who have switched from slow, costly hand-fastening methods to the faster, better Bostitch wire-fastening method. More than 800 Bostitch stapling machines, wire stitchers, self-feeding hammers and tackers promise you a specific cost-cutting solution to any fastening problem. For proof, mail the coupon below today.

FASTENING BURLAP TO SPRINGS is an easy one-hand job with a Bostitch stapling plier. Its deep throat lets you place staples 4⅜ inches from edge of material. Hundreds of other uses in assembling, packing and shipping.



REACHING HARD-TO-GET-AT PLACES is easy now with Bostitch automatic tackers. Trigger-action shoots staples in within ⅛" of corners. A great time-saver and cost-cutter on many jobs.

SEALING ODD-SHAPED CARTONS is no problem at all with Bostitch Autoclench stapling machines. Staples are clinched on the inside entirely from the outside. Quick and easy, neat and secure. Tops in top-sealing!

ATTACH THIS COUPON TO YOUR LETTERHEAD

BOSTITCH, 540 Mechanic St., Westerly, Rhode Island

Please send me literature describing how Bostitch machines cut fastening costs in furniture and other woodworking operations.

Name.....Title.....

Firm.....

Street.....

City.....Zone....State.....

BOSTITCH

fastens it better, *AND FASTER* with wire

ALL TYPES OF MACHINES FOR APPLYING STAPLES
ALL TYPES OF STAPLES APPLIED BY MACHINES

Trade-Mark "Bostitch" Registered U. S. Patent Office and Foreign Countries.

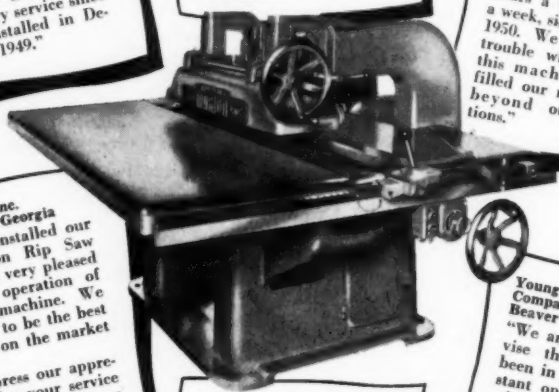
IF IT'S A *Marion* MODEL "M"

. . . You'll be pleased as are these users with this Modern, Straight Line Glue Joint Rip Saw!

National Homes Corp.
Lafayette, Indiana
"The Marion Model M Rip Saw which was installed in our Lafayette plant for ripping plywood has been giving satisfactory service since it was installed in December, 1949."

Bullard Lumber Co.
North Hyde Park, Vermont
"We are able to report complete satisfaction with the Marion Model M. It is run continuously 9 hours per day, 50 hours per week. We cut 1¼" thick stock to ⅝" widths."

Ray Wood Heel Co., Inc.
Newmarket, N. H.
"Marion Rip Saw Model M is used to rip 2⅛" and up to 3" kiln dried hard maple, 100%. We are using a Carbide tipped saw on this machine, operating it eight hours a day, five days a week, since January 2, 1950. We have had no trouble whatever . . . this machine has fulfilled our requirements beyond our expectations."



The Smiths Inc.
Barnesville, Georgia
"We have installed our new Marion Rip Saw and we are very pleased with the operation of this new machine. We believe it to be the best Rip Saw on the market today.
"We express our appreciation for your service and interest which you have shown."

The Westwood Corp.
San Antonio 2, Texas
"We are using this for ripping oak for edge glueing. We think the machine is tops and so far are elated with its performance."

Young Manufacturing Company
Beaver Dam, Kentucky
"We are pleased to advise the machine has been in practically constant operation on 5/4 edge glued oak stock and is doing very fine work. We should be pleased to recommend its use to anyone interested in a like machine."

For a Tough Job—
For Any Job—

. . . only the *Best* is good enough!

● *There is no substitute for carrying the stock past the saw blade in a straight line. The MARION MODEL M is the only straight line, glue joint rip saw designed in that belief—that is why we are sure if you*

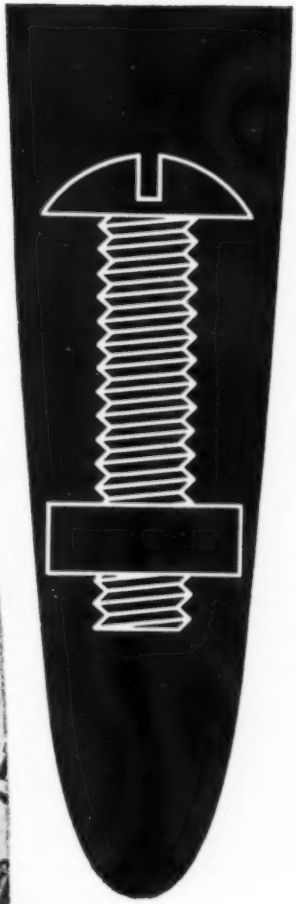
Compare . . . YOU WILL *Insist* ON A *Marion*

SEND FOR CIRCULAR OF FULL DETAILS AND SPECIFICATIONS

MARION MACHINE, FOUNDRY and SUPPLY COMPANY

DEPT. WWD, MARION, INDIANA, U. S. A.

There's a difference between stove bolts and stove bolts



To be sure, it's not enough to specify size and style of fastening. The making of a fastening makes a world of difference. And Blake & Johnson has spent 100 years acquiring the skill, the methods, the machinery, the resources and the reputation for making dependable fastenings, precisely to specification. To be sure of getting uniform fastenings that best fit your needs—that mean faster application and longer-lasting assemblies — specify *Blake & Johnson.*

Stove bolts—in special sizes as well as in all standard lengths and diameters —are just one of the items readily supplied from Blake & Johnson's complete line of metal and wood fasteners and parts.

BLAKE & JOHNSON *Fastenings*

Slotted or Phillips head machine screws, wood screws, stove bolts, tapping screws, special headed products; nuts, rivets, chaplets, wire forms, screw machine products . . . in steel, stainless steel, copper, brass, bronze, everdur, nickel, nickel silver, monel, aluminum . . .

THE BLAKE & JOHNSON COMPANY
WATERVILLE 48, CONNECTICUT

1849—1950

A CENTURY OF MANUFACTURING FASTENINGS FOR ALL INDUSTRY

Please send me your new catalog containing full data on the complete line of Blake & Johnson fastenings.

NAME

TITLE

COMPANY

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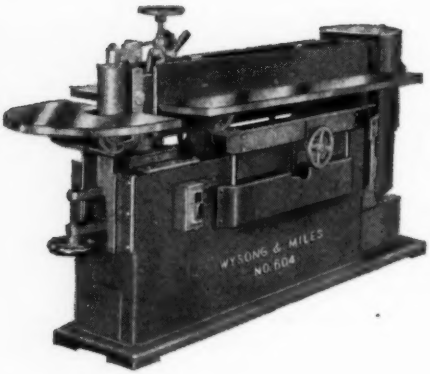
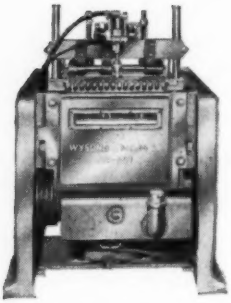
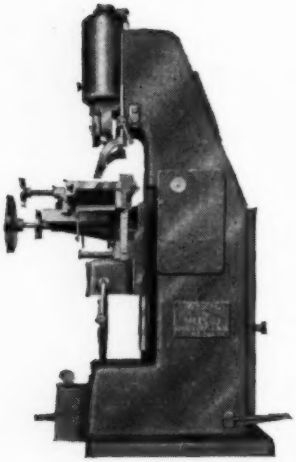


No. 604 Edge Belt Sander
Oscillating and Non-oscillating
models



No. 601 Automatic Dovetailer,
for fronts and backs.
Companion machine No. 600,
for drawer sides.

Unmatched PERFORMERS



No. 284 Automatic
Hollow-Chisel Mortiser.

AUTOMATIC DOVETAILERS
Increase production up to 85%.
Cleaner, better fitting dovetails.

HYDRAULIC STROKE SANDERS
Single belt and double belt, reversible.
Give smoother finish and increase production.

BELT SANDERS—EDGE BELT SANDERS
8 models to choose from.

DISC & SPINDLE SANDERS
4 models to choose from.

AUTOMATIC MULTIPLE MORTISER WITH HYDRAULIC FEED
The finest mortiser built.

SINGLE SPINDLE MORTISERS
Automatic or with foot feed.

See your dealer or write to the factory for full information. Each Wysong and Miles machine is backed by 50 years experience in the manufacturing and design of wood-working machines.

WYSONG and MILES Co.

GREENSBORO, NORTH CAROLINA

Let "CASIE & RESIE" CONVINCE YOU...

All Glues Aren't The Same!

Just as square pegs aren't built for round holes, so there is no single glue formula for all adhesive jobs. That is why the National Casein man who calls on you can give you access to a *balanced* glue line that includes casein glues, hot and cold resin glues, water-proof glues and vegetable glues.

National Casein Gives You The Right Glue For Your Job

Your National Casein man is a *glue* man. Through him you deal directly with the manufacturer of one of the world's finest, widest and best balanced lines of industrial glues. Through him you have access to strategically located warehouse stocks. Let him tell you what "Casie" and "Resie" have learned about the right glue for your job.

Manufacturers of
Casein and Resin Products
Since 1919

Submit your adhesive problems without obligation.

CONTACT THE OFFICE NEAREST YOU!

STICK WITH US . . WE'LL STICK FOR YOU

NATIONAL CASEIN Company

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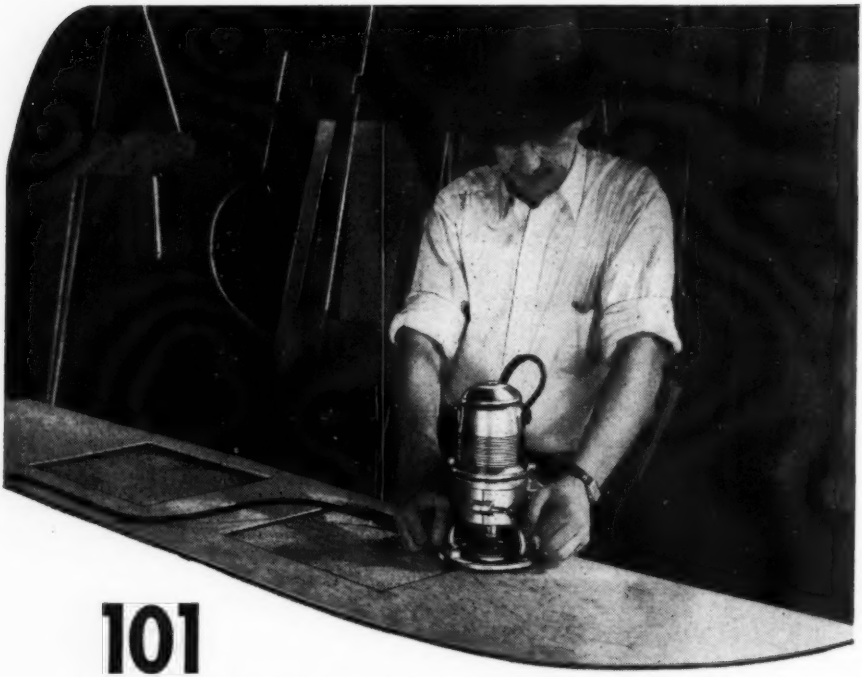


101

OPERATIONS WITH THIS ONE MACHINE

In thousands of woodworking plants, such as this trailer-maker's shop, Stanley-Carter R5A Routers work full time . . . pay for themselves in jig-time. This router, with new Stanley-Carter high speed steel bit No. 1512 or tungsten carbide bit No. T-1512, is used to cut through, pilot and rout—three operations with one tool. More than a hundred cutting and forming operations are performed on trailer bodies with this versatile machine . . . at high speed. Material is plywood, $\frac{3}{8}$" to $\frac{3}{4}$" thick, but high speed of router (18,000 r.p.m.) gives smooth, clean cuts that need no extra finishing.

Simple, accurate micrometer depth adjustment. Templet guides, straight and circular gauge and a variety of accessories and bits fit the R5A for a multitude of cost-cutting jobs. Built for years of use. Oversize ball bearings; motor shielded from dust. Ask your dealer for C-52 booklet on shop tips, or write Stanley Electric Tools, 542 Myrtle Street, New Britain, Conn.

STANLEY

Reg. U.S. Pat. Off.

HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

"Drive thy business — let not that drive thee."

—Ben Franklin's Almanac, 1757

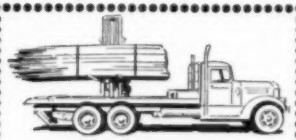
These days thee must work a month for the taxgatherer before thee begins to work for thyself. Keep a firm hand on the wheel of savings to bolster thy "nett after taxes."

—Acme Steel's Notebook, 1950

How long, Mr. Lumberman, since you broke down your costs in packaging, shipping and materials handling operations? Acme sales engineers are specialists in finding profit leaks in this part of your business—then helping you plug them. In 9 out of 10 cases, we can point the way to greater efficiency and good, solid thrift with Acme Methods and Acme flat steel strapping, Acme stitching machines and wire, and other Acme Steel products.

We have already proved this for the more than 50,000 customers we now serve. A typical case is reported here. It takes just a minute to read it and call us in.

Acme sales engineers, technical facilities and nationwide service are ready to start helping you. Reach for the telephone and call the Acme Steel service office nearest you. (There are 46 of these offices in the principal cities of the U.S. and Canada.) Or send the coupon for details.



California Yard Saves 70% on Labor Alone

West Fresno Lumber Co., Fresno, Calif., handles lumber bundled with Acme Steelstrap for labor savings, quicker tallying, less damage and pilfering, reduced danger of injury to your personnel.

ACME STEEL

You're invited to watch us roll out the strip steel when you're in or near Chicago. Our rolling mills at Riverdale, Illinois, covering more than 1,700,000 square feet, house one of the largest, fastest strip steel operations in the world.

ACME STEEL CO. CHICAGO

ATTACH THIS COUPON TO YOUR BUSINESS LETTERHEAD

ACME STEEL COMPANY, Dept. WD-70 2838 Archer Avenue, Chicago 8, Illinois

Please send me booklets on Acme Methods checked.

☐ Please have sales engineer call.

☐ **Packaging, Shipping, Materials Handling**— "There's a better way to handle lumber" tells how Acme engineered lumber packaging can save you money.

☐ **Shipping (Carload and L. C. L.)**— "LUMBER 'bound to get there' FROM MILL TO JOB"

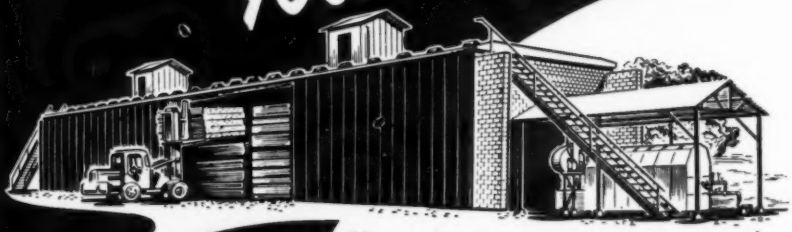
NAME_____ POSITION _____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

Is the lack of a modern dry kiln REDUCING YOUR PROFITS?



WHY?...DRY LUMBER THE OLD, EXPENSIVE WAY..

1. ...of providing a fire...
2. ...to heat the water...
3. ...to heat the pipes...
4. ...to heat the air...
5. ...to dry the lumber?

WHEN...THE CHRISTOPHER SYSTEM DOES THE JOB FOR LESS?

1. Providing the fire...
2. ...that heats the air...
3. ...that dries the lumber!

AND...DOES IT AUTOMATICALLY!

Here's how the famous CHRISTOPHER

Unitemp Heating System & Dry Kiln will make money for you!

If you manufacture products of wood, chances are you've already learned what improperly-seasoned material can cost you in the quality and reputation of your product. Why not operate your own dry kiln and be assured of wood that meets your requirements in quality and moisture content?

True . . . some dry kilns are expensive to buy and operate. **Not so with the Christopher System!** The Christopher Kiln is a proven system that costs from 1/3 to 1/2 as much, initially, as an ordinary kiln. Costs little to operate, too . . . depending on the price of fuel oil or natural gas in your territory.

Stop the wastage that comes from using improperly seasoned stock in your manufacture . . . and do so on a small investment. Learn what a Christopher Kiln can do for you, profit-wise. In replying, please give details of your lumber drying needs.

TODAY! . . . Phone, Write or Wire

CHRISTOPHER UNITEMP HEATING SYSTEMS, INC.

P. O. Box 1062, Prescott, Arkansas

REMEMBER

the sea gulls

The May issue of *Tax Outlook* magazine reprinted an excerpt of an editorial from a Fort Lauderdale, Fla., daily paper. We believe the writer hit the target dead center! Under the title "Let's Remember the Sea Gulls," J. W. Gore tells the following story.

"There may be something of a moral for the American people in what is happening to the sea gulls up in St. Augustine, now that the shrimp fleet has left the area for Key West.

"It seems the gulls have forgotten how to catch fish for themselves. For many years they have been depending on scraps and waste thrown overboard from the shrimping fleet. The free dinners made it unnecessary for them to use their own talents.

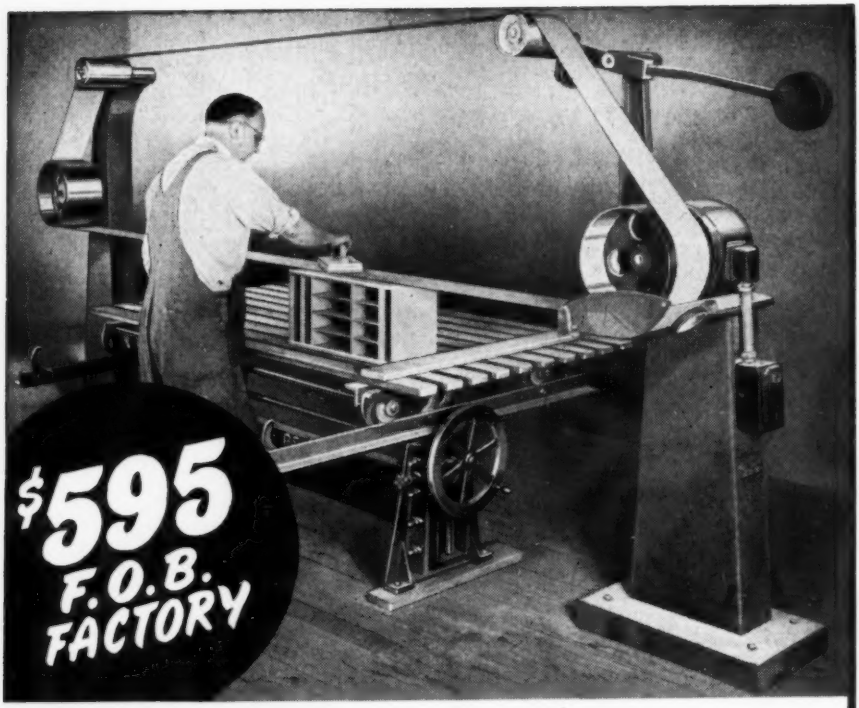
"But suddenly, the shrimp fleet went away. The gulls have not been able to adjust themselves to the new situation. The reefs and shores around St. Augustine are lined with long, silent rows of gulls with their dark eyes turned prayerfully out to sea—waiting for the shrimp fleet and the free meals that won't return.

"As generation after generation of gulls learned to depend on the shrimp fleet, parent gulls apparently forgot to teach their little ones the age-old methods of catching fish.

"It is a paradox that nature thus gives us. Here are some of the most independent creatures of the universe, with talents to take care of themselves, victimized because they succumbed to the something for nothing lure. They became dependent to such an extent that parents apparently forgot to teach offspring how to get along otherwise.

"We wonder if people aren't a great deal like these sea gulls. We wonder how many Americans have swallowed the idea of the welfare state until they think it is no longer necessary to teach their offspring that the day of government handouts and security for all may sometime draw to a close. And we wonder then, how many Americans may be left like the gulls—puzzled and bewildered because their sustenance has disappeared and they have no resources of their own to fall back on."

Ned Bailey
Editor-in-Chief



BEACH HAND BLOCK BELT SANDER

Used by more than 1000 leading industrial firms because of its economical efficiency and its versatility. For sanding and finishing wood products and for buffing products fabricated from aluminum, brass, bronze, stainless steel and plastics. Heavy steel construction.

Write for Free Folder

BEACH
MANUFACTURING CO.
MONTROSE, PA.

Pointed Paragraphs

With the 1950 summer baseball season, new use for plywood. Peanuts are part of the fun, but they should be hot. Armorply, U.S. Plywood's plywood with a thin metal sheet, is being used for storage boxes heated with a 300w heating coil. Same material can be used to keep soft drinks cold.

Milpak grading rules near completion. This method of upgrading low grade lumber is prophesied to have wide usage before the end of the year. Cabinet and wood novelty makers as well as furniture manufacturers will welcome the opportunity of buying these packaged hardwoods.

Because the industry requires such woods as white oak, cooperage manufacturers are being urged to take an active part in their state forest conservation programs. And it's time for a word of caution to all of us about forest fires this summer.

Slab wood and saw trimmings of Douglas fir are being used in a new hardboard. The bark is included in this new product manufactured in Oregon.

Do you like our new WOOD WORKING DIGEST cover? How many of these mahogany figures can you identify?

Business is good, but we can price ourselves out of the customer's reach. Special warning was given to builders on this subject. More than a million homes may be built this year, but if builders give in to fear about price hikes, the output for 1950 and 1951 may fall below expectations as far as sales are concerned.

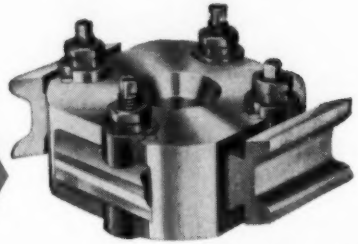
(Continued on page 40)

TO MEET A LONG-EXISTING NEED . . .

a New, COMPLETE line of cutterheads

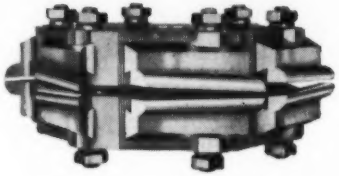
the Yates-American MACHINE COMPANY—Beloit, Wisconsin 200 series

For years the woodworking industry has wanted more bits in cutterheads—but milling additional slots through the head for use with wide clamps weakens the head body. To overcome this obstacle, Yates-American engineers developed a brand new line of cutterheads. They combined precision-boring with a circular-type bit clamp that leaves more of the head body for greater strength. Now more bits can be used with each head, increasing both accuracy and production. And the circular clamp design provides micro-lateral adjustment . . . requires less bit length for positive clamping . . . gets



BEVEL
STRAIGHT
BORE

SINGLE COPE



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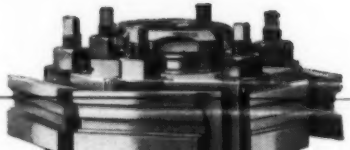
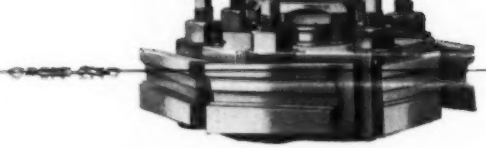


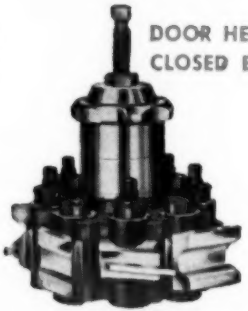
Now more bits can be used with each head, increasing both accuracy and production. And the circular clamp design provides micro-lateral adjustment . . . requires less bit length for positive clamping . . . gets up to 35 percent more bit life.

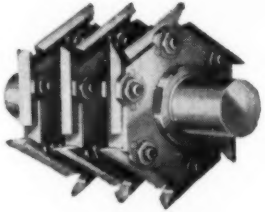


OPEN END TONGUE AND GROOVE

EASED EDGE, CLOSED END

DOOR HEAD, CLOSED END





BEADER

The 200 Series is a *complete* line . . . offering real production advantages for sash and door, special pattern and shiplap operations; for stickers, moulders, matchers, tenoners, glue jointers and other woodworking jobs. Write now for descriptive literature and detailed specifications.

Yates-American
MACHINE COMPANY—Beloit, Wisconsin

Branch Offices:
High Point, North Carolina
Memphis, Tennessee
Portland, Oregon

MATCHERS · BAND RESAWS · SANDERS · SURFACERS · CIRCULAR RIPSAWS

(Continued from page 37.)

We expect one article in this issue to cause some comment. As space permits, readers' reactions will be published.

Now that builders are getting away from "pint-size" homes and more family homes are being built by individuals for their own occupancy, larger pieces of furniture are making their appearancè. Results at Dallas and Jamestown indicate that demand for the larger pieces is growing.

Furniture retailers might do well to explore the possibility of working with home building contractors with a view to selling homes fully equipped with basic furniture requirements. Too many people find their bank roll almost exhausted by the time they are finished paying construction costs. If an arrangement could be made whereby the furniture could be included in the mortgage, more new homes would be built and so would more new furniture. We wonder if the National Retail Furniture Dealers Association has any suggestions.

Radio and television manufacturers are urged to watch their markets closely. Rumoured changes in chassis design may bring about important changes in cabinets.

Among the things that are hard to predetermine mark up this one. Piano and other musical instrument manufacturers were not too optimistic about their markets in view of the rapid development of TV sales. However, instead of hurting them it is helping sales. It must look easy to play a piano when viewed in a television set.

Glad to hear from the newly formed National Oak Wilt Research Committee that "the disease isn't spreading rapidly like the blight which wiped out chestnut trees." Here's hoping this worthy organization will be able to tell us soon they have found a way to successfully combat it.

Private enterprise still seems to be struggling along notwithstanding strikes, etc. Witness the following headline in the *Chicago Tribune*, "Armour Profit in 2nd Quarter 3.8 Millions," not bad, eh?

We are told by our South American representative that there is a growing demand for woodworking machinery below the border. Furniture and other wood products, moisture and termite proofed, are also in good demand. Mr. Charles Galassini of our foreign division will be glad to help any of our readers seeking information.

PENACOLITE® joints are unaffected by

Torrid Heat

Extreme Cold

Wet Weather

Condensation

PENACOLITE, the resorcinol adhesive that cures at room temperature, forms a bond with wood that is stronger than the wood itself. And that bond withstands the most extreme exposures. Freezing cold and baking heat are without effect, and the strength of the adhesive is not affected by salt or fresh water, by molds, fungi, organic solvents or most acids.

Penacolite Resorcinol Adhesives help reduce production time, too. They cure at room temperatures (70°F. to 90°F.) without the aid of strong catalysts, and pressures as low as 25 psi are often sufficient.

For wood bonds that are permanent under any wood usage, use Koppers Penacolite Resorcinol Adhesives. And to get complete information about these permanent adhesives, write for our free descriptive bulletins.

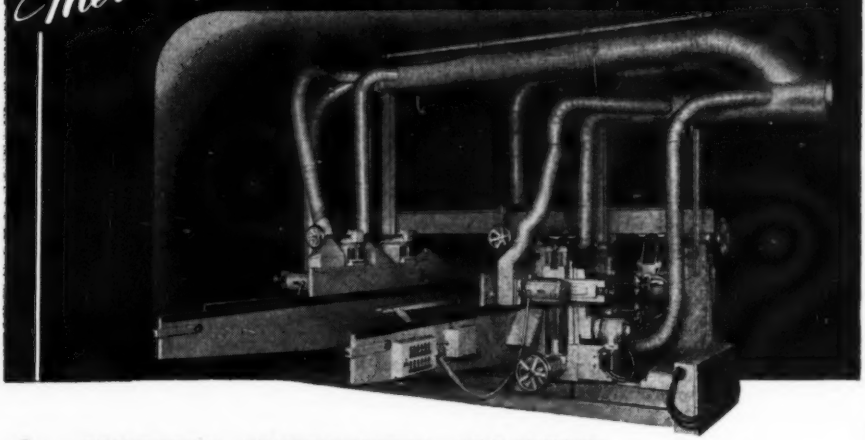
KOPPERS COMPANY, INC.
Chemical Division, Dept. WWD 70
Koppers Building · Pittsburgh 19, Pa.

PENACOLITE RESORCINOL ADHESIVES

Penacolite meets the most exacting requirements of the building industry . . . it is waterproof, will not deteriorate with age, and will withstand the stresses of wind and extremes of weather. Penacolite has proved itself on such projects as Lockweld Engineered Homes of Chicago. This artist's sketch shows a Lockweld Home that is typical of the ones in which Penacolite is used to bond both the interior and exterior plywood to the studs. Builders: Smith & Hill, Des Plaines, Ill. Architects-Engineers: Perkins & Will, Chicago.

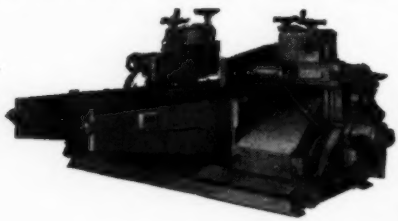
Mereen-Johnson

DOUBLE-END TENONER



the MODERN MOTORIZED MACHINE with Welded Steel Construction

Many intricate and special operations can be performed on the No. 400 Tenoner. Each machine is made to fit your requirements in a variety of sizes up to 20 feet or more between tenon shoulders. Chain beams can be extended to square cut up to 96 inches or more ahead of trim saws. Welded steel construction makes the beams 2 to 2½ times stiffer than cast iron. Optional equipment includes patented V-belt driven high speed cope motor units, stationary or jump dado arbors, scoring saws, tilting tenon motors, jump relishing attachment, window side frame grooving attachment, and many other items. **Write for Bulletin No. 400.**



Mereen-Johnson

DOUBLE CUT-OFF SAW

The No. 300 Saw can be depended upon for accurate production at high rates of speed. It is made in a range of sizes to fit different conditions, and can be equipped with such labor-saving attachments as cope motors, stationary or jump dado arbors, or other devices to meet specific problems. **Order Bulletin No. 300.**

Mereen-Johnson MACHINE COMPANY

4401 LYNDALE AVENUE NORTH • MINNEAPOLIS 12, MINNESOTA

The CHICAGO Market

ENTHUSIAM and good will radiated through the halls of the American Furniture Mart as the 1950 Summer Market, June 19-29, got underway. Attendance was predicted to at least equal last summer's registration. Buyers seemed ready to buy with the idea of taking care of present inventory requirements rather than speculatively as to what Mrs. John Q. Public would want in the next six months.

General Whiting praised the manufacturers in holding their price lines despite increases in costs of material and labor. "Even on new designs," he said, "which cost a great deal to bring out, the rise in prices has been only a maximum of 5%."

Extremely optimistic regarding fall home goods prospects, Maury Nee, 34-year old president of the National Retail Furniture Association, predicted a high level of sales throughout the remainder of the year. Some of the factors influencing home goods sales include: extensive building program now underway, television, a slightly liberalized credit extension policy and the fact that many home owners will want new furniture to replace old outworn pieces.

Before mentioning some of the specific styles and pieces shown, here are some general trends. Furniture at the Summer Market was said to have a more prosperous look even in the more reasonably priced lines. There is luxury and grace without ostentation. Furniture seems to be following the same style trend that the automotive field is—sleek, low slung, terribly efficient and gleaming bright. High gloss finishes are evident everywhere and hardware is bigger, more decorative and much more inventive.

Furniture designed for tele-viewing is more evident than ever before. Larger pieces, such as lounge chairs and sofas are on casters to be swung into groupings easily. Sectional sofas have concentrated on curves so that every seat is choice for viewing. Everything is being done to make it easy to turn the living room into a home theatre without sacrificing beauty.

Bases of modern case pieces have been brought up off the floor. Some believe that metal legs for furniture are on the increase. Newest underpinnings are brass loops that look like giant inverted hairpins.

Wood finishes are glossier than before and more highly polished. Emphasis is again on finishes that highlight the natural grain of the wood. Outstanding examples of the color trend

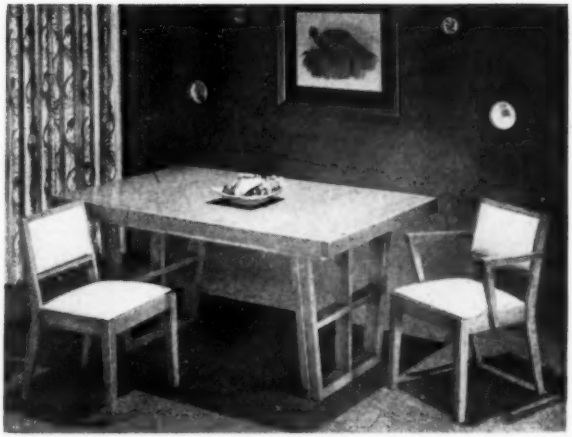
Winner of a Modern design competition, this suite was introduced at the Market by Johnson-Carper, Roanoke, Va. The wood finish is a rich "imperial walnut," while the legs and pulls are of brass.

Entering the modern dining room field, The Mengel Company offers the Calcutta Modern in Korina. Brushed brass pulls in two styles and the group also comes in gray walnut.

in wood are the new frosty plum and heather finishes for walnut. Light finishes have taken on a tawny hue. Exhibitors are employing a greater variety of woods. In addition to old standbys, mahogany, cherry, maple and walnut, there are birch, limed oak, pickled pine, knotty pine, ebony, Korina, Koa, Avodire, Prima Vera and Tulipwood seen in more evidence than before. Something quite new is the cigarette-proof laminated plastic in wood grain finish. Its appearance in bedroom and dining room case goods appears to be more than an innovation.

Harsh sharp furniture lines seen often in recent years seem to be softened with graceful curves making them more adaptable to combination with traditional styles.

Taking into consideration the prob-



Junior dining room in solid cherry in "Island Fan" finish. Contemporary "W-shaped" legs on the table and low chairbacks, fitting the small of the back, are features of this Crawford Furniture Co., Jamestown, N.Y., suite.

This suite is in cocoa-brown walnut. Headboard of the bed is flanked by two night-stands in the functional styling; cases are grouped in an attractive ensemble.

lem of living in small homes and apartments, storage and dual purpose units continue to be popular. Even small end tables have drawers, shelves or lids that lift to show storage compartments. Pie-shaped end tables are new and fit well with curved sectional sofas.

Of special import design-wise are the new drawer pulls. They may be of metal, wood or leather. There were several pieces shown where carving of the item itself formed the drawer pull.

Although slight price increases can be seen throughout the market, it seems evident that quality, design and construction have been stepped up to offset the rise in price.

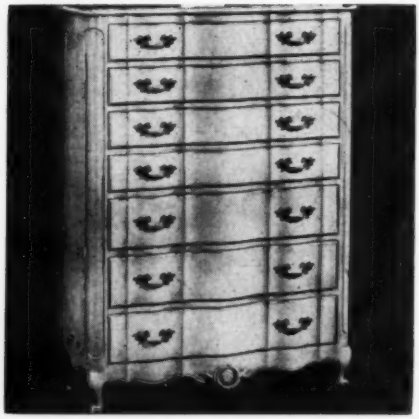
Consoles that double as dining tables, a desk-vanity with tambour doors and

"Parchment" finish Avodire gives this bedroom set a sleek look. Furniture by Cavalier Corp., Chattanooga, Tenn.

twin headboard to match are among the many functional pieces introduced by an eastern manufacturer.

A hardwareless bedroom suite in a Chinese mood was something which struck our fancy. Dielectric gluing has been used by one firm to give sol d wood appearance to maple paneled ends on their double chests. Very much in the novelty class is the appeal of West-

Evidence of a trend toward more ornate trim on traditional furniture. This Georgian mahogany buffet has deep carved trim and rich looking hardware. The top has a high gloss finish.



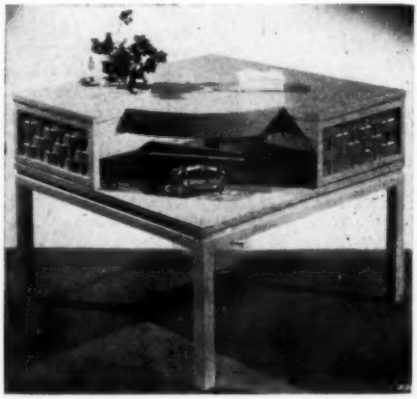
French Provincial styles in both fruitwood and painted finishes have a small but devoted following. Indications are that this style furniture is increasing in popularity.

ern cowboy furniture and motifs to the small fry. Die-embossed western figures appear on a strip across the headboard and footboards. This same design appears across the top ends of case pieces.

Traditional furniture continued in popularity, but more and more manu-

Twentieth century look is seen in this magazine-cocktail table. Made in ribbon grain Philippine mahogany, it is 60" long and 26" wide.

facturers are adding or swinging toward Modern lines. Foam rubber is used in many upholstered pieces—attention-calling was the 10 foot sofa

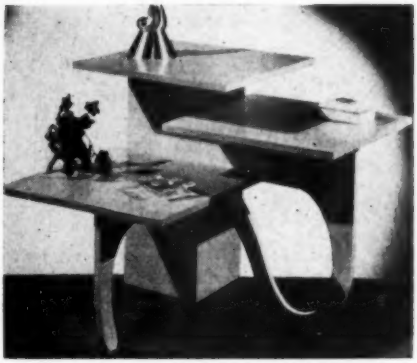


Corner table with center drawer can also serve as desk. It is available in Harvest gray, blonde, mahogany and cordovan. Hand-woven "Marcoid" in blending or contrasting colors are used on panel.

with removable bolster cushions which served as arms.

One manufacturer has put casters on the table in his dinette suite, making for easy movability in the small room.

This same type of ingenuity—giving the public what it wants even when it doesn't know what it wants—will characterize the firms who continue to make profits. A rather novel thought has been emphasized. Instead of figuring how much an item will cost and then add a reasonable profit, decide



Three tier Modern table with French curve. This light and graceful table can be ordered in light or dark finishes.

what Mrs. Housewife wants in a particular piece of merchandise, how much she will pay and then how it can be made and for what price.

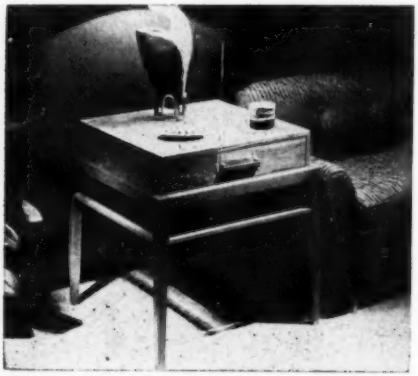
Although WOOD WORKING DI-

Natural ebony, hand rubbed and a clear lacquer finish to show the wood grain. Base is in black lacquer.

Mirror and drawer section of this vanity can be adjusted to any convenient angle. The drawer section will make a full circle turn. Drawers have serpentine front and wood is cordovan mahogany.

GEST goes to press before the end of the Market, we predict that this year's Market will be successful and stimulating to the entire industry. Furniture manufacturers are to be heartily commended in their meeting of higher labor costs and raw materials. With a bit of caution and consistency, there is no reason why 1950 cannot be a profitable year—prophetic we hope of this new decade ahead of us.

The End



Walnut lamp table with convenient storage drawer. Tapering legs and narrow stretchers give appearance of lightness. Finish is warm gray beige.

BAND RESAW

The Mershon No. 36D single band resaw was designed as a general purpose machine. With the close coupled saw wheels, together with the sensitive straining device, efficient adjustable guides and tilting feed rolls, this machine is especially suited for the resawing of bevel siding, moulding stock, furniture stock and all classes of resawing for general millwork.

For further details and brochure, write W. B. Mershon Corp., Dept. WD, Boston 27, Mass.

FACTORY TRUCKS

The Hamilton Caster & Mfg. Co. has issued a brochure showing their many different types of trucks. Here are a few of the floor trucks they manufacture: platform, two-wheel hand, box, shelf, wagon, lift trucks, skid platforms, dollies, trailers and special equipment. Hamilton has hundreds of different styles and sizes and can also build to meet individual requirements.

Casters and wheels for every industrial purpose are also available. Features include: oscillation, shock absorption, anti-friction swiveling, proper bearings and correct lubrication.

Hamilton Caster & Mfg. Co., Hamilton, Ohio.

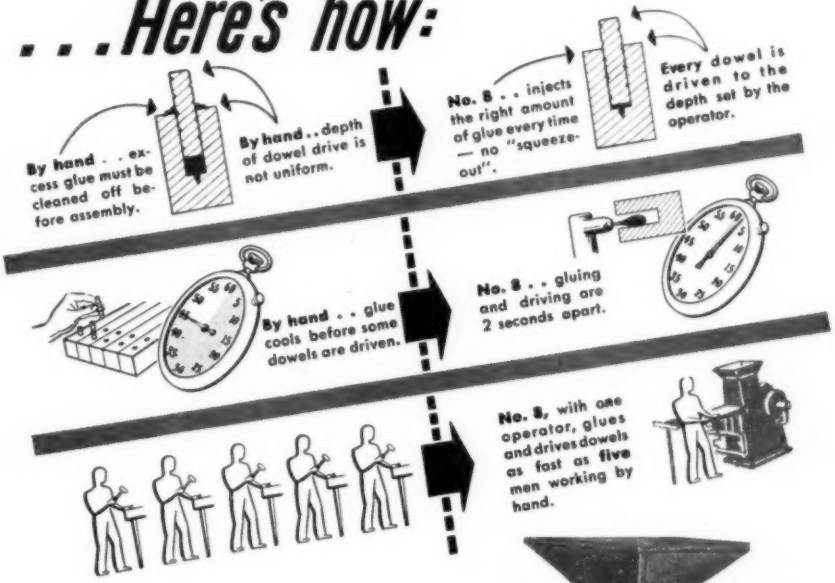
HI-SPEED MOULDERS

"Ekstrom, Carlson Hi-Speed Moulders" is a 12-page, 2-color bulletin released by Ekstrom, Carlson & Co. Ecco Hi-speed moulders in 6", 8", 10" and 12" capacity, lag or chain bed, with or without hopper feed are described and illustrated. General specifications are given for cutterheads and knives.

Ekstrom, Carlson & Co., Rockford, Ill.

Better dowel joints actually cost less

. . . Here's how:


By hand . . excess glue must be cleaned off before assembly.
By hand . . depth of dowel drive is not uniform.
No. 8 . . injects the right amount of glue every time — no "squeeze-out".
Every dowel is driven to the depth set by the operator.
By hand . . glue cools before some dowels are driven.
No. 8 . . gluing and driving are 2 seconds apart.
No. 8, with one operator, glues and drives dowels as fast as five men working by hand.

You get 5 times faster dowel gluing and driving . . . you save on "clean-up" before assembly . . . joints are stronger because dowels are driven while glue is **hot.** Result: Rock-bottom dowel driving costs — plus better finished products. Ask for full information on the Bell No. 8 Gluer and Dowel Driver.

The Bell Machine Company
71 Jackson Drive
Oshkosh, Wisconsin

BELL WOODWORKING MACHINERY

Research *saves markets*

●

by C. A. Rishell . . .

In this resume of C. A. Rishell's speech at the spring meeting of the A. S. M. E., we have included many highlights. Mr. Rishell gives a straight forward presentation of the great need for research in the woodworking industry. If you are interested in knowing more about how your firm can take advantage of available research reports, technical laboratories, etc, write to us and we shall be glad to provide additional information.

PROBABLY THE people who are responsible for technical progress in all industries are prone to underestimate the advances that have been made and for the most part see only the things that should be done. Therefore, this paper may unintentionally present the gloomy side of the picture as it exists in the wood products industry. If this is so, I wish to apologize to the many progressive firms that are using trained technical personnel and are engaging in research.

The chief reason for lack of progress in modernizing the wood industry is that trained men have not filtered into the industry in sufficient number to impact it to the required momentum.

The lumber industry, with the possible exception of agriculture, is one of the oldest existing in America. It has become very widespread since the days of the Colonists, but always the units have been small and designed mostly for taking care of the local needs of the particular community.

Small Units Restrict Research

Cost and lack of adequate transportation has continued to be one of the principal reasons for the small size of manufacturing lumber units. These small units when prevalent in an industry are likely to restrain technical progress. This is not meant as a criticism of our present system. The small units have served their purpose in the past and are doing a magnificent job today. However, since small units make up our industry, we must consider the research problem from that angle. The job of modernizing is more difficult than where industries are compact and comprised of a few large concerns such as the steel industry and others.

The wood industry may lose many of its present markets, but it will never lose them all and it will always be a favored raw material. It has its faults, but one of its big advantages is that

it can be used by relatively unskilled people whereas materials such as metals, chemicals, etc., must be developed and fabricated by technically trained personnel. Research in these fields has been a necessity.

In order to obtain technical progress, it is necessary that administrators and executives in the lumber and wood products industry be technical people themselves. This does not mean that we cannot have technical progress without college trained men. Many of our finest scientists and our best executives have never had the benefit of formal training, but in some way or other they have trained themselves.

Men trained in our technical schools can come into production plants in positions which at the moment are not of executive type, but positions which will provide the trainee with that necessary practical experience in production which he cannot learn in school.

Non-technical executives usually do not understand the barest fundamentals of technical progress. For example, I know of plants where haphazard methods for determining moisture content of lumber are still used: a few years ago when training kiln operators for a large lumber concern, I found that it was usual for the moisture content to be determined by boring a hole in the side of board. If the sawdust from the hole smelled wet and had the general appearance of a high moisture content, the lumber was not dry enough to use. Even today the personnel of many companies do not know how valuable a moisture meter can be.

Fundamental Versus Applied Research

The forest products industries are doing a considerable amount of applied research. However, with only one or two exceptions, fundamental research is not known or practiced in the industry. Fundamental research is expensive and it is a long time proposition. It is difficult to understand and it may or may not develop products along lines familiar to the firm that is practicing it. However, if the industry in some way can finance fundamental research, it will have terrific value in years to come.

Immediate Profits from Trained Personnel

It should be the general scheme of things to bring thoroughly trained technicians into the lumber industry in such a way that their training will immediately show a profit. There are many places where this can be done. For example, we need trained kiln operators. They will develop new processes and improve old ones.

In operations where glue is used, technical personnel can revolutionize the present systems. It is a long cry from the old fashioned glues that could be handled easily for general purpose jobs to the new types of specialized glues which require for their proper use an understanding of chemistry and the technology of wood.

The methods for finishing furniture are little different than they were 25 years ago, but here again we have chemical processes and the industry is trying to conduct a chemical operation without chemists.

In the manufacture of lumber and the machining of wood, advancement has been due almost entirely to the development of improved metals for machine tools. We have done nothing to help the metallurgist, much less to improve our methods of using the new metals. Lumber is planed today the same as it was 30 years ago. We saw about the same way with the same general type of saws. We have added a few ball bearings to the machines which reduces power consumption and per-

mits higher speeds, but the industry can be on the threshold of a revolution in machining if it will employ technically trained personnel.

Electronic Investigations

The wood industry has to a very small extent used electronic devices but the credit for developing these devices and for the use of them is not that of the wood industry.

In spite of ourselves, high frequency gluing has become widespread, but there are many other jobs that electronics can do for us. For example, we need to thoroughly investigate drying and treating methods. We can probably use electronics to help us stablize lumber against shrinking and swelling. We can use electronic equipment to detect metals in wood, to determine its density and perhaps to help us to better machine jobs.

We need new methods for quality control. Many products are now being made by the industry that could undoubtedly be tested by electronic devices to determine strength so that it would be definitely known whether each piece for a critical item has the necessary strength. For example, parts for wood ladders are all strength members and if weakened by unknown defects may cause injury or death to the user. Airplane parts, scaffolding and staging material and many other products require a higher order of quality control than we have so far developed.

Many wood producing concerns have been able to progress because they have employed chemists. For example, there are firms in the wood industry that are working with sawdust and other waste materials to develop hardboards, insulating boards, synthetic molding, fertilizers or soil improvers, fuels, etc. These organizations are using chemically trained technicians.

The industry needs to design new products and redesign many of the older ones.

Forty years ago all desks and other office equipment were of wood. Today only 50% of the desks manufactured are of wood and less than 7% of the filing cabinets. This isn't because wood doesn't make good office furniture, but partly because we have not improved designs we are losing the markets for the less expensive products.

Many of our chairs such as the folding variety and outdoor chairs are now being made of steel. We need new designs so that wood chairs will give better and cheaper service. These are only a few of the things where technical design is needed.

Modernizing the Production Line

Even in our sawmills and other production plants we need intelligent thought and planning to redesign our production lines. Often they are so antiquated that the cost in raw material and labor is more than double what it should be.

In cooperation with design engineers we need efficiency engineers who can work hand in glove with them. It is true that there are outside efficiency companies who will for a fee go onto a job and then make recommendations that may be helpful. But the industry needs its own efficiency engineers—men who are trained in this particular field, probably by the company itself.

Regardless of improvement in machining equipment or the skill of the manufacturer in reducing waste, the machining of lumber will always produce quantities of wood waste. Chemists, chemical engineers, mechanical engineers, plastic chemists and others should be turned loose to utilize the raw material which is now being wastefully used for fuel or worse still is

being burned without recovering the heat value of the wood.

Present Wood Products

From the foregoing one is apt to infer that it is the writer's opinion that our present wood products are not soundly designed, properly sold or that the physical structure of our industry in entirely wrong. Such is not the case. If it were so, our mills would not be producing large quantities of lumber. Our production today is on a reasonably satisfactory basis. Probably no other material can provide us with the economic housing which we have known in America or the fine furniture which is universally used. The problem is not whether our products and materials are good, but whether we can make them better. One way of making them better is to use them in combination with other materials to reduce cost and provide improved quality.

For example, the composite type of automobile body which was superseded by the all steel body only a few years ago was probably superior in strength to its successor and much superior to the early all-wood body. The loss of the market was due almost entirely to economic factors.

Today most of the large truck bodies and the special service type are of composite construction. We can probably hold these markets, especially if we proceed along technical lines, such as using new laminating procedures.

The wood station wagon body is rapidly giving way to steel because it was not economical to produce and was unsatisfactory in service. In this case a modest sum spent in technical developments to improve durability would probably have saved the market.

That we have lost many other markets because of lack of technical improvements in design and low cost manufacture can be quickly ascertained by looking into the windows of sporting goods shops, automobile sales rooms, furniture stores, etc. A few illustrations will serve to emphasize the point as follows: Automobile bodies, picture moldings, wood flooring, office furniture, candy sucker sticks, boats, containers, airplanes, instrument cases, wood blocks and pulleys, gun stocks, folding chairs and home cabinets. In the foregoing list some of the items deserve further mention. Picture moldings, for example, have to a very large extent gone to synthetic or molded type products. It is not hard to understand why this is so. Perhaps it is not a large market but it is worthwhile maintaining. We have lost many markets formerly held by wood flooring. Asphalt tile can be produced very cheaply and has been able to compete in many types of buildings.

The lowly stick for the all day sucker is only a small use for wood but illustrates a point. It seems impossible but true that sucker sticks can be made of wound paper cheaper than from the wood dowels. Fiber containers, because of skillful technical progress and millions of dollars worth of research, have made huge inroads into the market which was formerly controlled almost 100% by wood.

The finest televison and radio instruments are advertised as having wood cabinets. However, for the highly profitable low cost market plastic cases have taken over the field. The production of wood cabinets is too expensive.

Many of the cheaper sporting rifles are now equipped with plastic stocks. In appearance they resemble wood but the principal virtue is low cost.

We Can't Hold All Our Markets

We can't save every market through technical research and the employment

of technical personnel, but we can hold many of them and for those which we lose we can gain replacements.

The wood products industries are vitally concerned with our transportation system. As stated, one reason for localizing lumber production was the lack of adequate transportation. Even with the most modern rail, water and truck systems ever developed, we have not solved our problems in the economics of transportation. Lumber is a raw material and except for the best grades is not highly refined. For every clear piece of lumber that is produced, there are several boards that have defects or waste that cannot be used in finished products. Highly trained, skilled technicians are needed to overcome this problem which when accomplished will reduce the cost of wood products to the consumer.

In the field of wood research many men could be beneficially employed to develop systems for stabilizing wood against shrinking and swelling. There is probably no technical problem facing the industry of more importance than this, yet our research organizations have displayed little interest in the problem. If we learn to economically stabilize wood, we can provide much better finishes.

Paints & Finishes

We have fairly reliable house paints that can be depended upon for years of service. Perhaps they can be improved and should be, but for many other products our present finishes are woefully lacking. For example, finishes have been developed for the metal surfaces of automobiles that will endure years of outdoor service but we can't use these finishes on wood nor can we expect the durability of any known wood finish to equal that on the automobile or the porcelain refrigerator. Perhaps overlays of plastic such as fiber glass or other materials can be used.

However, we have made some improvements in finishes. For example, it is now possible to purchase furniture that has cigarette-proof tops. We have perfected furniture legs so that the wood desk, for example, is much better than it was several years ago. But the improvements which we have today have been possible only because the industry has technicians who are working in a virgin field.

Speed Up Production

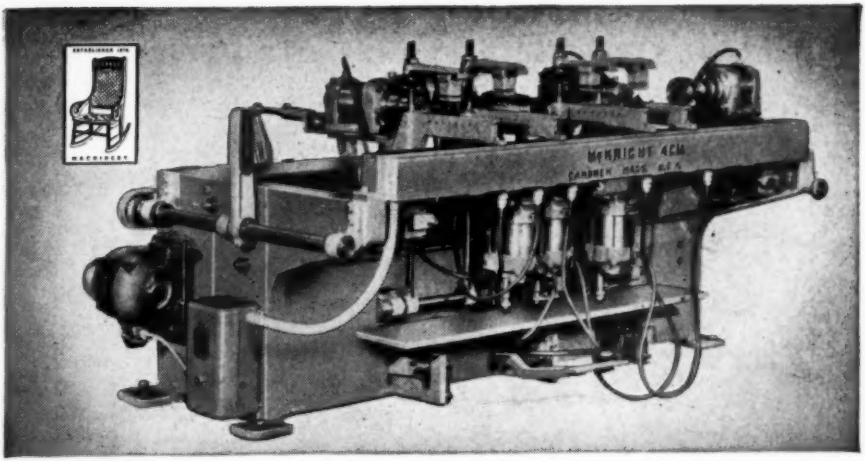
Many markets have been lost to the lumber industry because we have not developed new product designs that lend themselves to mass production. We have difficulty in competing with steel stampings or plastic moldings; they may not look as good as wood or be as desirable but they are cheaper and serve the purpose. A complete list of the loss of markets because of antique design would be very long.

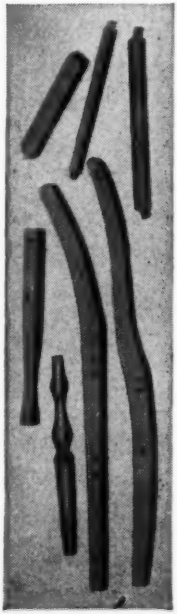
What Are We Doing?

In general the picture is not too black. Probably we will never be satisfied and certainly now is no time to rest on our oars. While we have done considerable, the harder jobs still face us and more technical personnel must be employed to tackle these problems.

There are many highly improved glues on the market. These could only have been developed by the painstaking work of scientists. The impregnation of wood with decay preventive materials is widespread. This development by engineers and wood utilization technicians is of tremendous importance and is not fully valued. Practically our entire railroad system rests on treated wood. Not many years ago the average life of a railroad crosstie was five years. Today 20 to 25 years is not unusual.

We have stress grades of lumber and





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Facts & Figures About Wood Research

A few facts and figures with respect to research may be interesting. Unfortunately, it is impossible to provide a dollar basis for your consideration, but perhaps we can get at it in some other way.

In accordance with the best information, 12,500 wood research projects have been completed or are being currently undertaken. Out of this total, 45.2% of the projects has been in the chemical and chemical products field; 15.6% in processes, materials and devices used with wood in order to improve or modify its properties and use; 11.3% in the field of primary timber and lumber products; 8.7% of the projects has been devoted to structure, identification and properties of wood; 10.7% to fabricated wood products; 6% to building, building parts and other structures, and 2½% to means and devices for the selection of wood.

Who Is Doing the Research?

In order to assist technicians in obtaining work in the industry or the research organizations which are working for it, it is desirable to have some knowledge as to where these researches are being conducted.

There are 118 colleges and universities in the United States conducting wood research, 97 Federal and state organizations, 238 manufacturers of for-

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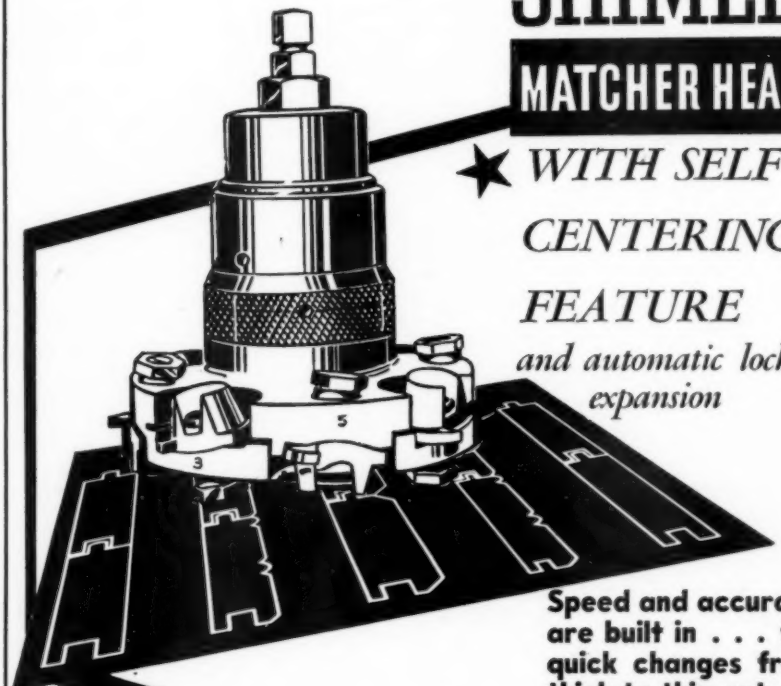

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est products, 868 processers, consumers and materials suppliers, 201 professional societies and commerical laboratories, and 98 trade associations, all of whom are undertaking wood research in some form or other. Some of the projects are large, some are small and the foregoing figures of course give no indication as to the dollar value of the research in the various subdivisions mentioned.

Some Needed Research

These projects which are listed may not be the most important nor are they necessarily in the order of importance.

Surveys to determine quantity, location and form of waste wood. Also surveys to determine the economics of various researches now under way. For example, what are the potential U. S. markets for hardboard, feeding yeast, molasses, fertilizers, etc.? What influence have freight rates on the use of wood for such purposes?

A more comprehensive compilation of all known research in wood. The Forest Products Research Guide published by the Committee on Products and Research of the National Lumber Manufacturers Association is a beginning but only scratches the surface. It tells where research is being done but not how much or the value of it. Also there is no complete bibliography on research.

Research coordination is badly needed, not only to prevent duplication but to prevent the loss of valuable research data. During the war the government and private industry conducted hundreds of uncoordinated projects. The value of much of this work will be lost because there is no complete centralized recording of these data. For example, a review committee working under the direction of the Munitions Board surveyed all govern-

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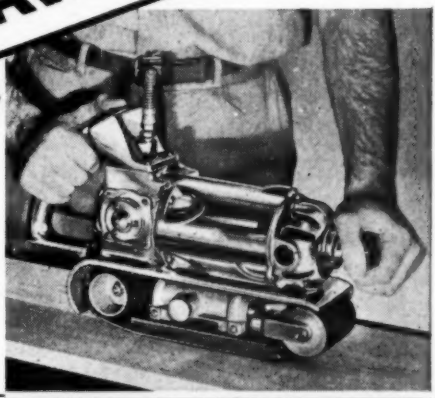

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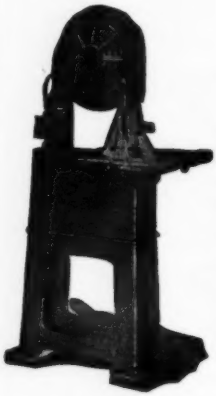

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ment specifications for articles where wood is used. These data which required thousands of hours to prepare now seem to have been lost.

Research to develop processes for stabilizing wood to resist shrinking and swelling. Both fundamental and applied research are necessary.

Research in lignin.

Elimination of defective material from low grade lumber at the source of production rather than in the fabricator's plant.

Improvements in drying and pressing equipment for hardboards from wood waste.

Improved design for woodworking equipment.

New fast adhesives, particularly of the waterproof variety, and simple inexpensive equipment for obtaining required clamping pressures especially for cured members.

Inexpensive (portable and permanent) equipment for debarking small logs, slabs and other sawmill and woods waste.

The Timber Engineering Company maintains a technical laboratory on the outskirts of Washington, D. C. It has engaged in several hundred projects, most of which have been applied research, but some fundamental research is being conducted. It would be impossible to mention all of the work done by this organization, but of special importance are the schools which will be conducted at the laboratory to assist hardwood manufacturers to cut up and package remanufactured low-grade lumber so that it can be shipped and used more economically. The work at the Teco laboratory is not confined to lumber manufacturers. It includes furniture and adhesive manufacturers as well as any other concerns or individuals interested in wood products.

The End

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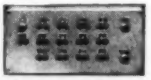

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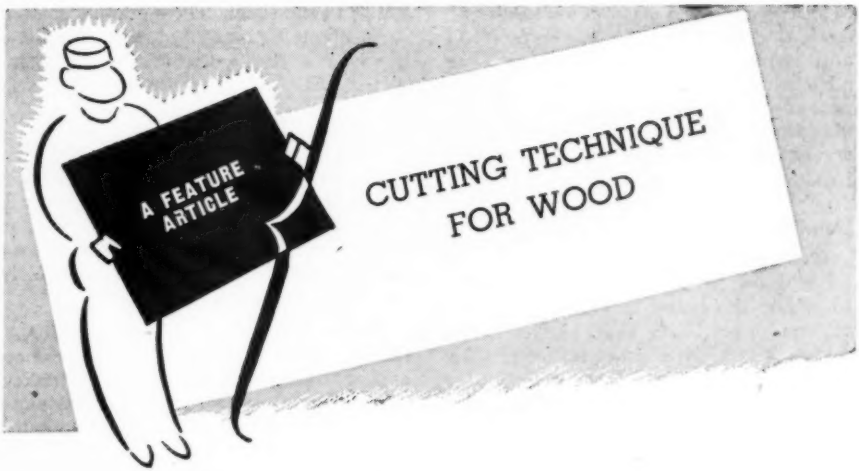

Part IV. Rotary Cutters, Planers, Jointers, Shapers, Stickers, Molders

By Thomas D. Perry

THE PRECEDING articles in this series have dealt with various types of saws. Saws have the primary function of converting logs into boards, and the secondary function of dividing these rough boards, after drying, into smaller pieces of the approximate size required for the end product. To perform its duties, a saw must cut a relatively narrow slot, which will have somewhat roughened edges, since saw cuts, to be economical must be made at rather high speeds.

The rotary cutter, on the other hand, has as its principal function, the removal of this roughness from the sawn surfaces, edges and ends of these pieces, either individually, as for a square table leg, or in an assembled condition where pieces have been glued together edgewise, as for a plywood core. Rotary cutters may be designed to produce flat surfaces, as in a planer (surfacer) or jointer; or to produce curved surfaces, as in a shaper or molder. Most rotary cutting, in addition to smoothing the surface, is used to obtain the final net dimension or shape, with a slight allowance for subsequent sanding or scraping to a "polish finish."

The rotary cutter does not have the limitation of operating in a narrow slot, as does the saw, but removes larger chips or shavings from exposed surfaces. Special attention must be given to making these shavings small enough, or to break them up sufficiently, so that they can be removed by the dust collecting system. In planer cuts, attention must also be devoted to maintaining pressure on the surface ahead of the cut, so that particles are not torn out below the level of the desired surface. This is particularly likely to happen in the cross grained areas of a board, where the grain direction is "in" rather than "out." Such hold down

mechanisms are called "chip breakers," since they tend to keep the chips small and to prevent the tearing out of long slivers. In general, the board moves past the cutter head, although there are exceptions where the rotary head travels, as in certain types of veneer jointers.

Fundamentals of Rotary Cutting

The mechanism of rotary cutting, in its simplest form, is shown in Fig. 1, in which the board is moving in a direction opposite to that of the knife, which is standard procedure. In some

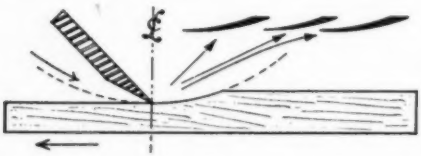

Fig. 1. Basic process of rotary cutting.

types of rotary cutting the knife and the board move in the same direction, which usually requires more power, but is likely to give smoother cutting on cross grained stock. There is also a hazard, where both move in the same direction, that the cutter may tend to accelerate the speed of the feed and this may wreck the machine, damage the work or injure the operator. Theoretically the chips, if not broken up, will be somewhat oval and crescent shaped, as shown in the sketch. It is to be noted that this chip is thinner at the point where the knife enters the cut than where it leaves, at the surface of the board. This is the main reason why the uni-directional cut requires more power, as it starts a heavy rather than a light cut.

Wavy Cutter Marks

A surface made by a rotary cutter is not perfectly flat. Actually it consists of a series of minute ridges with valleys between, which with slow feeds, may be scarcely perceptible either to the eye or to the touch. The smoothness of a surface can be measured, approximately, by the frequency of these ridges, under the following formula:

$$\frac{\text{Ridges}}{\text{Per Inch}} \quad \frac{\text{R.P.M. x No. Knives}}{\text{Feet p.m. x 12}} = \frac{\text{Cuts p.m.}}{\text{In. of f.p.m.}}$$

The ridges left between the cuts are due to the distance moved by the board in the intervals between the successive contacts of the cutting edges, and result in a slightly wavy surface, which can be smoothed by sanding.

Where rotary cut surfaces are to be glued, sanding is not desirable, since a sharp clean knife cut surface makes a better glue joint than a sanded surface. Rotary knives cut evenly, in spite of the fact that the wood may have soft and hard areas, while sanding tends to cut more deeply at the softer spots. In addition, sanding is likely to leave a thin film of fine dust that interferes with wood gluing.

A good rule for surfaces to be glued is approximately 16 knife cuts or ridges per inch, fewer cuts being permissible on non-dense woods that yield readily under pressure; and more being desirable on hardwoods that are less likely to squeeze down under pressure.

Rough planing, as for lumber yard stock, seldom has more than 6 to 8 cuts per inch.

Rotary cut surfaces that are to be sanded smooth for coatings and finishes should ordinarily have about 20 cuts per inch, and on curves that may be difficult to sand smooth, even higher cutting ratios are desirable. However, there is an economic factor between planing and sanding that may be a reasonable guide. More rapid feeds in planers may be offset by heavier sanding and the reverse.

As a matter of convenient information, Table 1 is supplied, based on rotary cutters operating at net 3500 R.P.M., the customary actual operating

Table 1. Knife Cuts Per Inch
Net spindle speed, 3,500 R.P.M.

Feed (1)	Number of Knives per Head 2	3	4	6	8	10	12	Feed (1)
20	29.2	.... ..	.... ..	.... ..	.... ..	.... ..	.... ..	20
30	19.4	29.2	.... ..	.... ..	.... ..	.... ..	.... ..	30
40	14.6	22 0	29.2	.... ..	.... ..	.... ..	.... ..	40
50	11.6	17.5	23.2	.... ..	.... ..	.... ..	.... ..	50
60	9.7	19.6	19.4	29.2	.... ..	.... ..	.... ..	60
80	7.3	10.9	14.6	22.0	29.2	.... ..	.... ..	80
100	5.8	8.7	11.6	17.5	23.2	29.2	.... ..	100
120	.... ..	7.3	9.7	14.6	19.4	24.3	29.2	120
140	.... ..	6.2	8.3	12.5	16.6	20.8	25.0	140
150	.... ..	5.8	7.8	11.7	15.6	19.4	23.2	150
160	.... ..	.... ..	7.3	10.9	14.6	18.2	21.8	160
180	.... ..	.... ..	6.5	9.7	13.0	16.2	19.4	180
200	.... ..	.... ..	5.8	8.7	11.6	14.6	17.4	200
220	.... ..	.... ..	.... ..	7.9	10.6	13.2	15.8	220
240	.... ..	.... ..	.... ..	7.3	9.7	12.1	14.6	240
260	.... ..	.... ..	.... ..	6.7	9.0	11.2	13.4	260
280	.... ..	.... ..	.... ..	6.2	8.3	10.4	12.4	280
300	.... ..	.... ..	.... ..	5.8	7.8	9.7	11.7	300
325	.... ..	.... ..	.... ..	.... ..	7.2	9.0	10.8	325
350	.... ..	.... ..	.... ..	.... ..	6.7	8.3	10.0	350
375	.... ..	.... ..	.... ..	.... ..	6.2	7.8	9.3	375
400	.... ..	.... ..	.... ..	.... ..	5.8	7.3	8.7	400
425	.... ..	.... ..	.... ..	.... ..	.... ..	6.8	8.2	425
450	.... ..	.... ..	.... ..	.... ..	.... ..	6.5	7.8	450
475	.... ..	.... ..	.... ..	.... ..	.... ..	6.1	7.4	475
500	.... ..	.... ..	.... ..	.... ..	.... ..	5.8	7.0	500
550	.... ..	.... ..	.... ..	.... ..	.... ..	.... ..	6.7	550
600	.... ..	.... ..	.... ..	.... ..	.... ..	.... ..	5.8	600

(1) Feed of work past the knife head, feet per minute.

speed, under load, of a nominal 3600 R.P.M. motor. Similar tabulations for other speeds can be computed from the above formula.

Critical Angles

The angle at which the cutting edge of the cutting knife comes in contact with the wood is important. The effect is essentially a chisel cut. Even an amateur carpenter realizes there is a preferred angle for efficient chisel cutting, and that other angles do not cut as satisfactorily. The several important angles for rotary knife cutting are illustrated in Fig. 2, and are described in the caption.

In square head machines the cutting angle (C) is usually about 40° from the radial line; and the clearance bevel (A) is 30° or sometimes up to 40°. An approximate rule is that the length of the bevel (on the flat side) should be twice as great as the thickness of the knife, i.e., a ½" bevel on a knife ¼" thick, which represents a 30° angle.

In the round head machines the cutting knives are thinner and supported either by exterior clamp plates, or clamped within slots in the head. The cutting angle (C) in round heads is usually less than in square heads, approximately 25° to 30° from the radial

Fig. 2. Angular relationships in rotary cutter knives. I—square head, thick knife; II—round head, thin knife, single bevel; III—round head, thin knife, double bevel. (A) clearance bevel, as edge is normally ground on back of knife; (B) cutting bevel on front of knife; (C) cutting angle as knife is positioned on head.

line. The clearance bevel (A) differs little between round and square heads, as well as between thick and thin knives.

Double bevel knives are useful, with an additional bevel ground on the face of the knife, and called the cutting bevel (B) as illustrated. Examples are: a cutting bevel of 15° and a clearance bevel of 25° works well on dry soft pine and spruce; while a cutting bevel of 25° and a clearance bevel of 15° (just the reverse) works well on dry oak.

Still a fourth type of bevel, not shown, is sometimes used as a secondary clearance bevel, to support the cutting edge for heavy cuts in dense woods. This may reduce the clearance bevel to almost 0°, with an edge that closely approaches a tangent on the cutting circle. The efficient use of this modified bevel requires a background of long experience. There is a considerable variation among experienced operators as to the best bevels for different types of cutting, and no standard rules can be suggested.

Reference was made above to the danger of tearing out the grain. This possibility is shown in Fig. 3, contrasting the relation of the rotary cut to the grain direction. It is obvious that cutting "into" the grain is the most likely to tear out chips and slivers, a liability that is substantially reduced by properly designed chip breakers or hold downs, just ahead of the actual point of cutting.

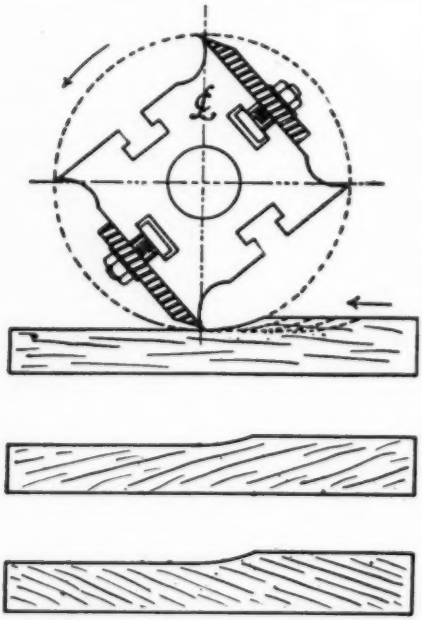

Fig. 3. Effect of grain direction in rotary cutting. Upper: cutting "with" grain; Center: cutting "out" of the grain; Lower: cutting "into" the grain.

Types of Knives

Mention has been made of thick and thin knives, which differ considerably in their design, fabrication and mode of attachment to the head.

A thick knife has sufficient inherent rigidity to be bolted on the face of the cutter head, through slots in the back edge of the knife. While the thickness depends on the size, it is usually of the order of ½" and up. Thick knives have steel faces with hardened cutting edges, integral with a stiff body of tougher tool steel, in which the attachment devices are located. These cutting faces may be either hardenable high alloy steels, welded in place; or tungsten carbide cutting edges brazed to the tougher steel body.

Thick knives with square heads are the rule on stickers, shapers and molders, particularly where special contours are used, many of which are custom made for the requirements of each job. These special cutting contours are developed graphically and geometrically according to the angle at which the cuts are made. Brazed tungsten carbide faces

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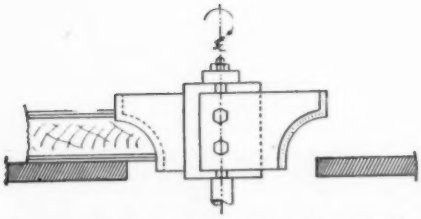

Fig. 4. Side elevation of single spindle shaper making modified Ogee cut.

are not readily ground to special contours, but must be factory made to shape. Thick knives of standard or special contours are easily made and set up, although they do present some balancing problems, but they are a greater hazard to workmen than round heads.

Thin knives, on the other hand, have cutting members of high alloy steel, which are somewhat limber, and require backing or stiffener plates of tougher steel, which are in separate units and not welded together. They are usually ¼" and thinner. Where thin knives are mounted in the slots of round heads, the backing plates can often be eliminated. While thin knives can be used with backing plates on square heads, Fig. 6, they are more commonly used in round heads, which have a much higher safety factor than the square heads.

Types of Heads

There are three principal types of heads used in rotary cutting:

(1) Square heads, used chiefly with exterior clamping.
(2) Round heads, usually slotted for thin knives.
(3) Solid heads, for long runs of standard shapes.

A typical square head was shown in Fig. 3, with two operating knives. Provision is indicated for two more knives, making the standard square head thick knife setup that is in such general use. This type of head, in years gone by, was quite customary on planers and jointers, but in these applications has been largely superseded by the safer round head.

Derived from the original square head are many types of multi-sided rotary cutter heads, the types of which merge into circular cutter heads with inserted knives, sometimes accommodating as many as 12 knives. The number of such cutter head types is legion, but even more numerous are the devices for clamping knives in such heads. Manufacturers of cutter knives frequently develop, patent and promote their own exclusive types of cutter heads, most of which have proved satisfactory in service. To what extent one is superior to another is a matter of experience and judgment, with wide divergences of opinions. To attempt to explain even a few would divert attention from the fundamental principles which are the function of this article. The most important fundamental is a relatively simple head, requiring a minimum of adjustments, but with a maximum degree of firm clamping that will insure safe operation and a uniform quality of production.

The versatility of the conventional square head is so great that it still remains standard equipment for single and double spindle shapers, which are shown in Figs. 4 and 5. The two spindles revolve in opposite directions, to permit cutting a round end without

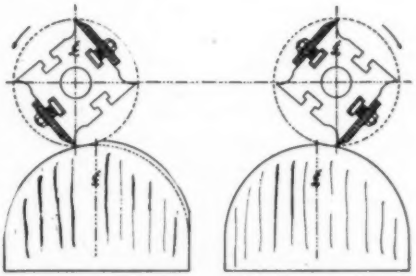

Fig. 5. Top view of double spindle shaper, rounding a table end.

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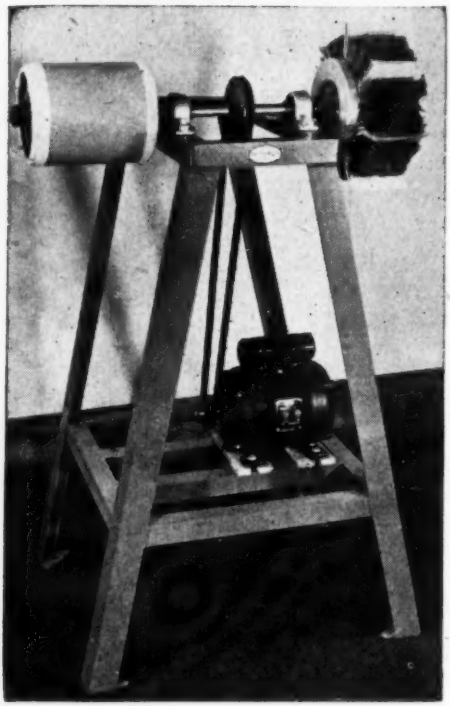

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cutting "into" the grain.

Square heads, supplemented by clamping or stiffener plates will also accommodate thin knives, as shown in Fig. 6. Such thin knives are generally used for straight, rather than irregular, curved or extended cuts, since adequate backing for such irregular cuts may be quite difficult.

Round heads are a later development than square heads, although they have been extensively used for many years, chiefly for straight flat surfaces. They are safer, give less lodgement for chips and shavings and are more readily balanced. Round heads may have curved outer clamp plates as shown in Fig. 7, which houses two thin cutter blades for edge jointing. Special pin wrenches may be provided for flush head bolts, with a reasonable clear-

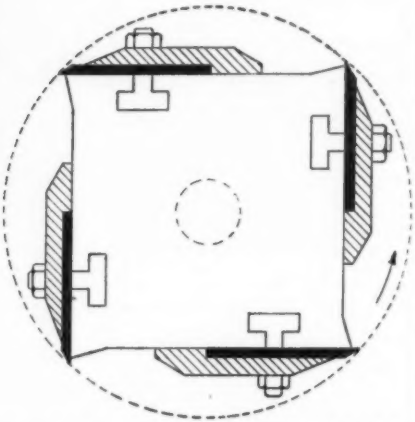

Fig. 6. Square head equipped with thin knives.

ance away from the cutting circle. Another type of round head, with six thin knives, is shown in Fig. 8. These knives are set in angling slots on a planer cutter shaft and clamped, with recessed set screws against a bearing plate, which holds the knife firmly and rigidly to the edge of the slot. This edge of

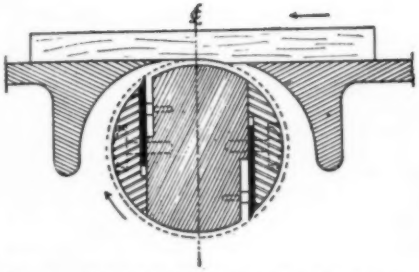

Fig. 7. Round cutter head for jointer.

the slot is part of the solid head and carries the shock of the cut as each knife hits the wood, while the clamp screws serve only to hold the knife in its cutting position. This provides a degree of stability not possible with exterior clamping plates, as in Figs. 6 and 7.

The cutter heads or shafts in Figs. 7 and 8, can be jointed in position at operating speeds, a process that distributes the cutting load equally over all the knives. Many other types of clamping devices are used, frequently individually and exclusively sponsored, by the makers of various machines.

Spiral slots for thin knives have been used to a limited extent for the purpose of distributing the power load on the motor, as well as making smoother

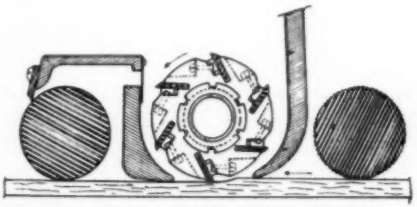

Fig. 8. Cross section of working parts in planer. From right to left as board enters cutting area: corrugated infeed pressure roll; chip breaker and hold down, spring operated; round cutter shaft with 6 thin knives; guard bar to prevent escape of chips; smooth outfeed pressure bar, with scraper.

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cuts with less ridges. While the operating results have been satisfactory, the added complications of spiral slots and the attendant clamping devices usually more than offset the advantages.

Solid cutter heads, with cutting edges integral with the body of the cutter, are extensively used where long runs and standard shapes make them economically practicable. Such solid heads are also made with brazed tungsten carbide lips. These solid cutter heads, of relatively small diameter and rather short, may have one or even 20 or 30 cutting teeth, in which case they bear some resemblance to circular saws or milling cutters. Such solid cutter heads are of moderate sizes, and are especially adapted to supplementary cutting on combination machines, such as double end tenoners, molders, flooring machines and the like.

Balancing Cutter Heads and Shafts

It is of the utmost importance that complete cutter heads of every type are properly in balance when set up and ready to run. High speeds accentuate the slightest degree of unbalance, resulting in rough and irregular cutting, as well as in undue fatigue stresses in the metal. It is for this reason that round heads, with more evenly distributed metal present fewer difficulties in attaining proper balance, in contrast with square heads and externally attached knives of varying shapes. Every shop using rotary cutter heads in woodworking, should have adequate equipment for testing balance in any rotating cutter shaft and should never release a cutter for use until it has been properly balanced.

Conclusions

An attempt to describe the design and functions of rotary cutters in a few pages can be at best only a brief outline of the various types, and can no more than mention a few of the more important features. However these fundamentals need to be emphasized from time to time in order to promote clearer thinking in the many problems that rotary cutting brings to woodworkers. The rotary cutter, in its multitude of applications, is a basic woodworking tool, and needs to be far better understood than it is.

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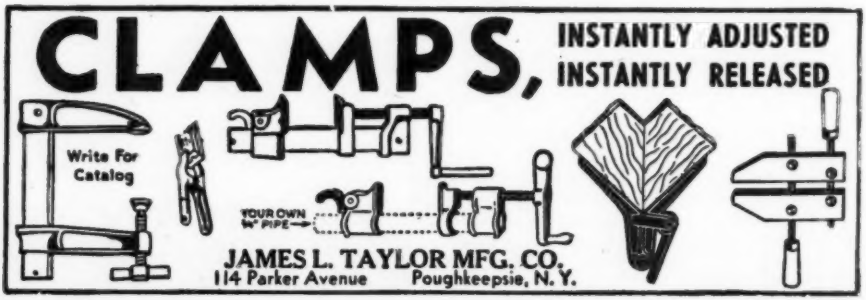

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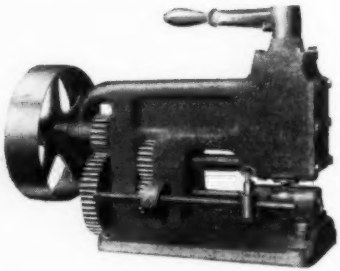

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The Controlled-cut
SAW BLADE

by L. H. Reineke . . .

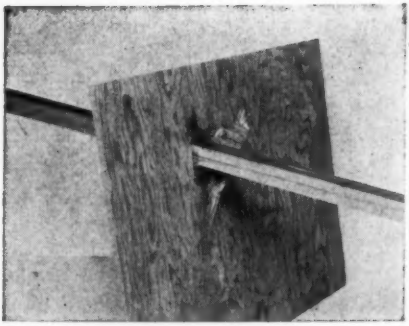
In the April issue we carried a short write-up about this controversial saw blade. Readers expressed a definite interest in the blade and we are publishing this article to give you additional details. Write to the editor if you desire further information.

THE SHORT thumb or missing finger is a sad badge of the woodworkers' trade, though not so tragic as the injured eye or granite headstones that sometimes result from accidents with power saws. Studies by the Swiss Accident Insurance Institute indicate that although body contact with the saw may result in loss of fingers or hand, more serious injury or even death may be caused by projectile-type accidents, in which wood pieces are hurled violently by the saw. Even a careless worker has a cautious respect for the self-evident cutting ability of a saw, but few fully appreciate the causes and possible violence of unpredictable kickbacks.

As part of its program of saw development and studies of saw operations, the Forest Products Laboratory has made some tests of the safety of operation of a new type of saw as it was subjected to materials and operating procedures most productive of kickbacks.

Kickback Dangers

The most serious of these kickbacks occurs in the edging of boards, usually short ones somewhat longer than twice the distance from the front of the saw to the back of the table. At the instant that the edging is finally severed, the overhang beyond the table causes the front end of the edging to rise. If the front end swings in toward the saw, it may be caught by the teeth and "javelined" forward with enough force



As javelin throwers, Olympic champions offer no real competition to ordinary circular saws. Piece of wood here was driven through the ⅜ inch plywood by a saw.

to pierce a body completely, usually in the zone of vital organs.

The next most important type of kickback occurs during repeat ripping, in which a piece of wide stock is ripped into three or more pieces. In bringing the stock back over the saw for the next cut, the back end of the piece may be dropped enough to be hooked by the saw. The piece may be hurled forward with either a spear-like or a tumbling motion, depending on the length of piece and position at the moment of contact with the saw.

A third type of kickback occurs in ripping short pieces not much longer than the chord of the exposed segment of the saw. Normally, the stock is simultaneously fed and held against the fence by a diagonal pressure applied at the outer corner. At the instant the cut is completed, this diagonal pressure tends to swing the further end of the outer piece into the back of the saw, where the rising teeth may lift the stick and throw it forward, with an additional chance that the hand may strike the blade as the piece suddenly jumps.

Fourth most frequent among accidents not involving direct contact with the saw are those resulting from small loose pieces (end trimmings) being caught by the rising side of the saw and thrown upward and forward, resulting mostly in eye and other face injuries.

Pinching is another cause of kickbacks, but is readily prevented by the use of a splitter. A splitter is useless with the opposite action, spreading, which may cause serious kickbacks by crowding the stock between saw and fence against the saw so that the rising teeth at the back lift the piece and throw it forward. This action is induced by the long fences common on American saws. Such fences are prohibited in Switzerland, where the short fence used, extending only one or two inches beyond the cutting point, permits the stock to spread without crowding against the saw.

Modern bench saws are supplied with fairly effective safeguards, such as splitters, saw hoods, and kickback dogs, to protect the user from kickbacks and bodily contact with the speeding blade. Only gross negligence will cause serious accidents when those safety devices are in position, but certain operations may require their removal or be less convenient with them in place. Removal of safety devices, whether through necessity or wilful disregard of safety in favor of greater convenience, exposes the operator to a tool that can be diabolically sudden in committing mayhem at either close or long range. Since exposure is sometimes necessary, but most often wilful, bettering the protective devices is futile, and the most logical countermeasure is to tame the danger source, the saw blade itself. Such is the solution to safety problems which is offered by a type of circular saw new in this country.

This new type of saw, on which patent coverage has been or is being obtained in this and many foreign countries, was invented in Germany and is being made by a saw manufac-

turer in Switzerland. These saws are now available in this country.

Design of New Saw

The design feature that makes the saw so much safer than the ordinary saw is the back of the tooth, which limits the maximum cut per tooth. An unusually small number of teeth is used, thus giving greater rigidity to the blade.

One feature of the controlled-cut type of saw is that stock can be fed to the rising side of the saw without having it whipped from the hands. The lifting effort of the teeth is limited because very few teeth are in the cut, the cut per tooth is light, and self-feeding or drawing of the stock into the saw is limited to the rate established by the tooth design. Even though the saw may not be perfectly fitted, and the stock permitted to leave the hand, the speed imported to the pieces would be very very slight, and not at all dangerous. A spring hold-down attached to the fence or splitter would be enough to prevent runaway in feeding with the saw instead of against it as normally done.

Safety Factors

Feeding with the saw would have a number of advantages from the standpoint of safety. In case of body contact the rising teeth would tend to throw the part away from the saw, rather than drawing it into the saw. The edgings, blocks, or other pieces that travel toward the sawyer in normal kickbacks will travel away from the sawyer. Sawdust will also be thrown away from the sawyer, but a suction pickup above the table will be needed. Any pinching that develops will occur at the back edge where the travel of the teeth is downward, holding the stock against the table and permitting the saw to relieve the pinch.

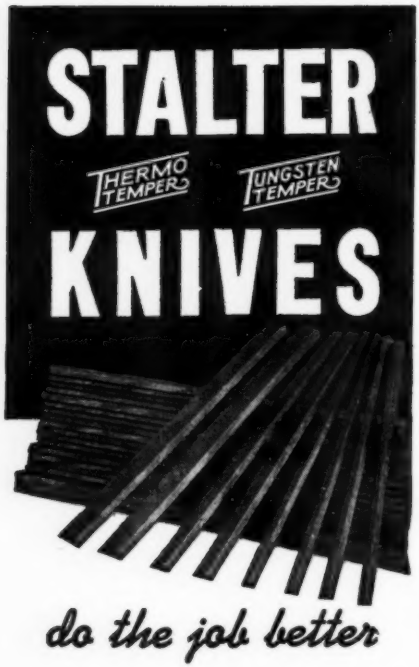
To retain the original safety of operation, accuracy in resharpening is necessary, and a true arbor and collars will prevent cancellation of the gains in safety derived from design and accurate fitting. Hand filing, of course, is undesirable. The usual saw sharpening machine can be used, or a shop-type grinder can be used with the special, inexpensive fixture that is available.

The new controlled-cut saw blade.

The greater safety offered by the controlled-cut saw is indicated by the favorable rates granted by the Swiss Industrial Insurance Institute when the saws used are of the type. To compare the relative safety of the controlled-cut saw with the usual American type of saw, a series of tests were conducted at the Forest Products Laboratory under conditions permitting measurement of kickback forces. A plywood panel was placed in front of the saw blade, suspended at its top edge so that it could swing freely in its supporting framework. By measuring the angle of maximum swing when struck by kicked-back wood, the panel served as a ballistics pendulum.

F.P.L. Tests

Saws of the controlled-cut type and conventional American saws of the



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same gauge and diameter were used alternately on the same arbor at the same speeds for each test.

For the first test, edgings ¾ by 1¼ by 36 inches were placed alongside the saw in the position they would have at the instant of complete severance from a board being edged. The overhanging end, just long enough to overbalance the portion on the saw table, was given a slight swing (by an off-vertical guide) to bring the forward end of the edging against the saw as it swung upward. With both spring-set and swage-set saws it was not possible to make the edging catch on the saw and be hurled forward. With the conventional American saw, no kickback could be produced by this manipulation, although it is known that such kickbacks do occur and can be serious.

In the second test, the ends of short lengths of stock were brought into quick contact with the saw with the stock in both a horizontal position and sloping down toward the saw at 30° to simulate the action when stock is allowed to touch the saw as it is being brought forward for a second ripping cut. Pieces of red gum 15 by 4 by ¾ inches were used for these tests, and the maximum kickback energy for the controlled-cut saw was only 0.045 foot-pound, whereas the conventional saw produced a kickback of 0.25 foot-pound, about five times as great.

In another test, 1 by 6 boards 2 feet long were fed from the rear of the saw to rip through the middle of the piece. Boards were fed flat on the saw table and also by resting the back end of the board on the saw table and slowly lowering the front end onto the saw so that the initial point of cutting was 2 inches in from the end. With the controlled-cut saw it was easy to hold the stock against the slight pull of the saw, which was very light and could be overcome by a fairly light downward

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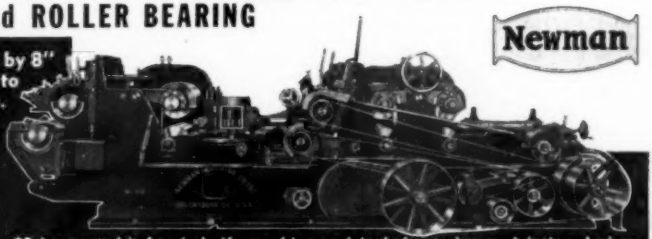

$*10,950 F.O.B. GREENSBORO, N. C.

*Price quoted is for six knife machine and includes truing or jointing devices for top, bottom and side heads, also tight pulley or flexible coupling. Eight knife cylinders can be furnished at additional cost, also single or double profiler (as shown).

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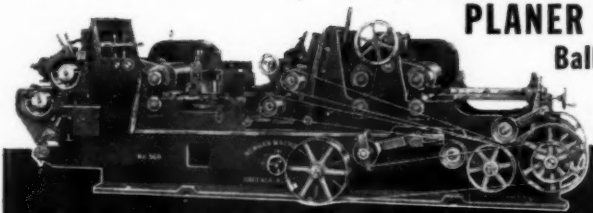

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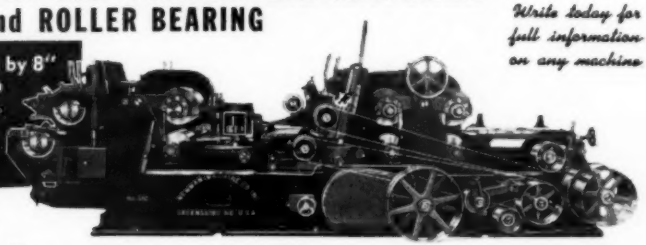

$††9,975 F.O.B. GREENSBORO, N. C.

†† Price quoted is for six knife machine and includes truing or jointing devices for top, bottom and side heads, also tight pulley or flexible coupling. Eight knife cylinders can be furnished at additional cost, also single or double profiler (as shown).

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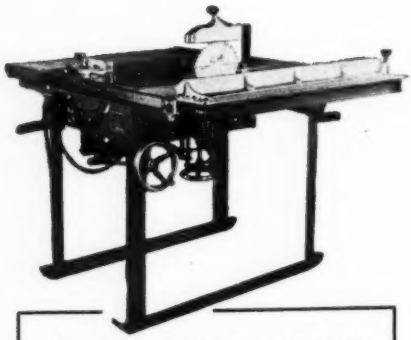

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pressure on the stock, such as could be provided by a spring hold-down attached to the fence. With the conventional saw, strips can be balanced on the back edge of the saw table and the end allowed to ride on the top of the saw. The piece can be fed slowly downward until cut through, but if the stock is then fed with the saw it may be whisked forward very violently. One such piece, having an end area of 1¼ square inches, was driven 16 inches through a ⅜-inch, 5-ply Douglas fir panel.

The danger from small pieces flying (end trims) was compared by exposing the saw 2 inches and pouring a box of ⅞-inch cubes onto the back half of the saw from a height of 12 inches. The cubes lying on the saw table were then pushed into the back or rising side of the saw. With the swage-set, controlled-cut saw these cubes were tossed upward a maximum of 1¾ feet and only a short distance horizontally, with not enough speed to sting. The spring-set, controlled-cut saw, having twice as many teeth as the swage-set, tossed some of the blocks somewhat higher and faster, but not dangerously so. The conventional saw, however, snapped the blocks forward and upward at velocities sufficient to dent plywood about 1/16 inch, and a splinter from one block was embedded in the plywood deeply enough to require a slight tug to remove it. Many of the blocks thrown by the conventional saw passed, at eye level, the position a sawyer would normally occupy.

Some pieces of 1 by 5-inch dry red gum known to have internal stress that would produce pinching were ripped into thirds, one cut with a conventional saw, the other with the controlled-cut saw. The stock had some twist and when the front end of the piece reached the back of the saw the downward pressure was shifted to the

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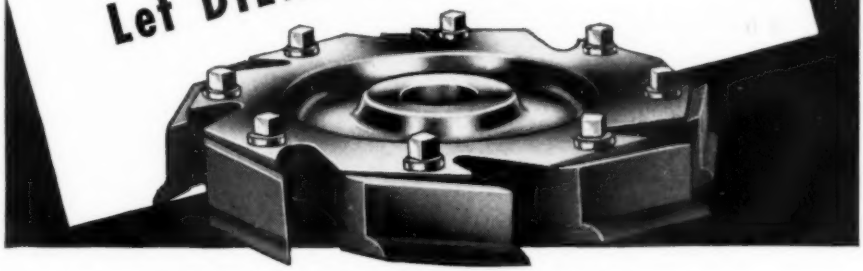

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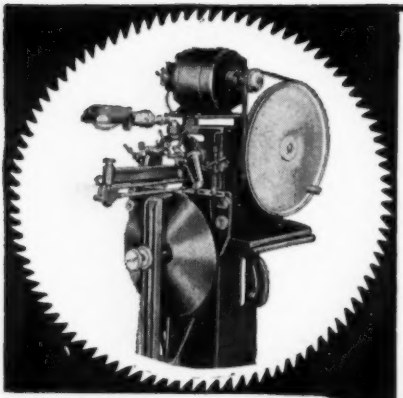

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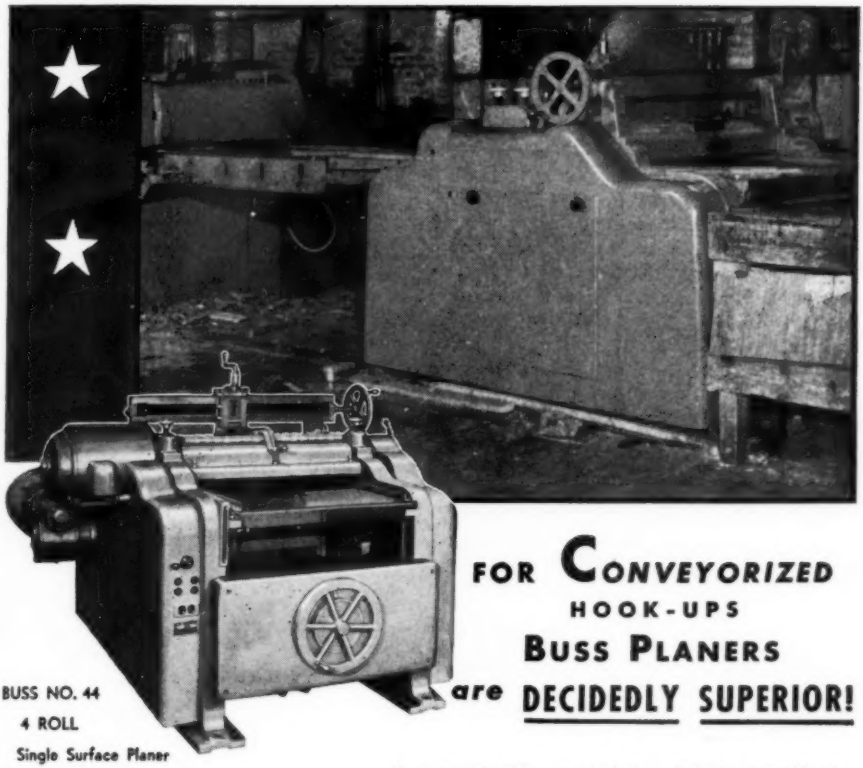
opposite edge of the stock to aggravate the effect of the pinching by twisting. No reaction could be induced with either controlled-cut or conventional saws, although this procedure is known to produce grabbing.

Some short pieces of stock 1 by 3 by 9 inches were placed along the saw on the side away from the fence, to represent rippings or wide edgings, and a diagonal pressure applied to force the far end of the piece against the rising edge of the saw, as in normal practice where the stock is pressed by hand toward the fence during feeding. With the controlled-cut saw, no lifting of the edging could be obtained unless it was swung sharply into the back of the saw. Under such conditions the edgings were sometimes turned over sideways, but never thrown off the saw table. With the conventional saw the same reaction was obtained but somewhat more violent in one instance when a ripping struck the plywood panel 15 inches above the saw table level with about 5 foot-pounds energy.

With the saw stopped, and projecting ½ inch above the table, a piece of ¼-inch board 6 inches wide and 18 inches long was placed on the saw table with the leading end resting on the saw about halfway between the near edge and the top. The saw was then started, to simulate the occasion on which a fence might be adjusted from a layout mark on a short board, the balance point of which is slightly off the saw table unless the board is pulled forward and thus engages with the saw. On starting up, a low-powered saw may be stalled, but it is more likely that the board will be whipped forward. Under these conditions the controlled-cut saw barely slid the pieces off the saw table, with practically no tooth marks on the end of



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the pieces. With the conventional saw, the forward starting thrust was somewhat more vigorous, and the saw tooth usually ripped out splinters about 2 inches long.

As a final test, pieces of 1 by 5-inch red gum were cross cut on rip saws with the stock held in the hand 1½ inches above and clear of the saw table, and feeding into the saw (not with the saw). The swage-set controlled-cut saw made the cuts under these conditions with only a few minor tugs or jerks that were easily restrained by the hands, even when the board was deliberately wobbled in both horizontal and vertical planes. With the spring-set controlled-cut saw, a little stronger action developed, pulling the board from the light finger grip used, but not hurling it violently. When similar cuts were attempted with the swage-set conventional saw, one cut was completed, with several strong grabs that nearly pulled the board from a tight finger grip. In attempting a second cut, the board was violently jerked loose with sufficient force to bend and break the corners from a number of the teeth.

The controlled-cut saw has real merit on hand-feed saw benches, where high feed rates are not the rule. The small number of teeth make the saw much quieter in operation than the conventional saw, and this feature contributes to the increase in safety. Taming of the saw seems to be slightly more complete in the swage-set type than in the spring-set type. On machine-feed saws, fully housed and provided with anti-kickback and other safety devices, the safety features of the controlled-cut saw are not needed, and the light feed per tooth will require very high spindle speeds to permit high production rates.

The End

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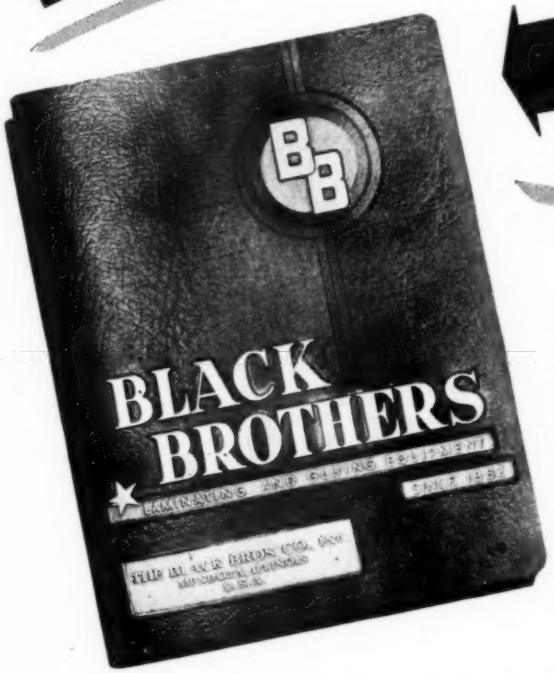

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Drying Lumber In Direct Heat Gas or Oil Fired Kiln

By Raymond A. Helmers

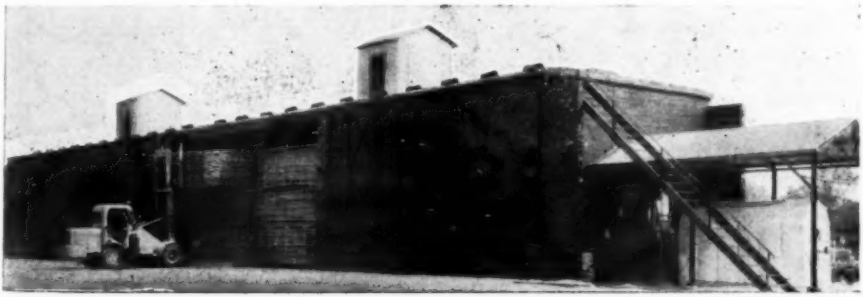
EARLY IN 1947, while searching for a method of utilizing low priced natural gas and fuel oil as the heating element for dry kilns, George Christopher and his associates evolved what is now known as the Christopher kiln.

Extensive research and experiment preceded the building of the experimental lumber dry kiln at Antoine, Arkansas. The perfecting of this kiln was welcomed by lumber manufacturers in Arkansas and other states where the abundance of cheap natural gas and fuel oil could be utilized for drying lumber. The experimental model had some bugs in it, these Mr. Christopher and his associates eliminated before any kilns were put on the market.

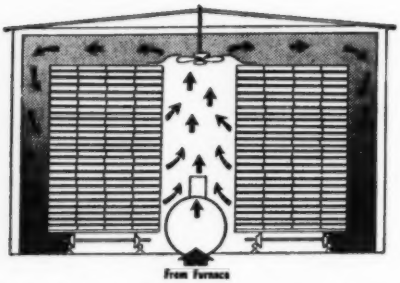
Before explaining the theory and operation of the Christopher kiln, it would be well to point out a few things on how moisture exists in wood and how drying takes place.

Moisture exists in wood in two different forms. Free water, as it is called, consists of real droplets of water in the cells of the wood, very much like water in a pail. In some wood the weight of the free water may be as much as 1½ times the weight of the wood . . . or the moisture content of the wood in free water would be 150%.

When the water in these cell cavities has been completely removed, the moisture content of the wood will still be about 25%, since the cell walls contain hygroscopic water. This hygroscopic moisture can be compared to that which is in the air or that which is absorbed by salt or other materials. When heat is applied to the surface of the wood, surface evaporation takes place; and, at the same time, water on the inside comes to the surface by



Side loading, gas-fired Christopher dry kiln, located at the Partee flooring mill, Magnolia, Ark. This is a double unit, with a furnace at each end of the kiln building.



Christopher circulation system, showing movement of air when fans are forcing air upward. Shaded area shows higher pressures.

capillary action . . . like a lamp wick. By this we can see why experiments of drying lumber by electronics from the inside out have failed; because the evaporation on the inside of the piece of wood brings about such a great expansion of water vapor that the wood literally explodes. The only successful way yet found to dry lumber is to allow the moisture to come to the surface by natural action and evaporate the moisture there.

After the free water has been removed, there still remains the hygroscopic water, which amounts to approximately 25% moisture content in all species of wood. This point in moisture content is known as the fiber saturation point.

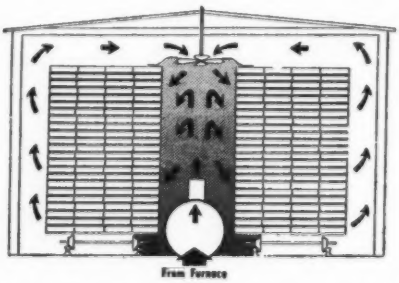
The hotter and dryer the air exposed to the wood, the faster will be the evaporation and the faster will be the movement of the moisture to the surface. However, too much heat that is too dry will damage the wood cells and cause degrade. So, therefore, both heat and humidity must be controlled in the drying of lumber.

Furthermore, as moisture is being evaporated from wood, unless there is a movement of air over it, a film of air will adhere around the board. This film will absorb more and more moisture until it will reach a point where it will no longer dry the lumber further. This phenomenon can be illustrated by recalling how vapor or "steam" seems to hang around uninsulated pipes in the winter. Remember, too, on windy winter days the weather seems much colder than on calm days. So, another requirement of the dry kiln is circulation . . . to move the saturated air from the surface of the lumber and replace it with dryer air.

We have established, then, that controlled heat, humidity and circulation are necessary for safe, fast lumber drying. The amounts of heat and humidity required depend on the species and thickness of the wood, and its moisture content. The Forest Service of the U. S. Department of Agriculture has published drying schedules to use as guides. However, supplementary drying schedules which are more appropriate for drying in the Christopher kiln are recommended.

Heat and humidity in the operation of a dry kiln are determined through wet and dry bulb thermometer readings from inside the kiln.

In order to explain the operation of



Christopher circulation system, showing high pressure areas and movement of air when fans are reversed. The metal baffle surrounding the fan and extending to the tops of the stacks of lumber on each side prevents circulation being limited to rotation around fan blade tips.

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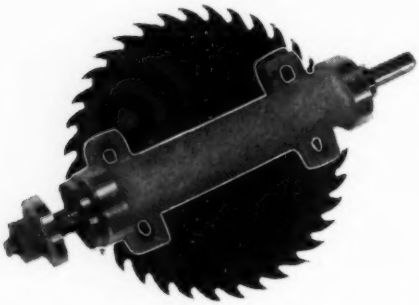

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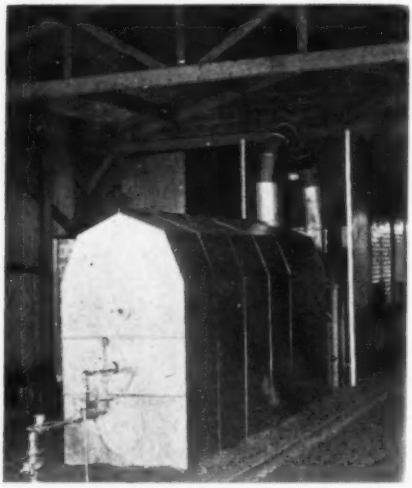
the Christopher kiln, let us trace the heating and movement of air, beginning with the burner in the furnace. The Christopher system has a simple method of heating a dry kiln. In the operation of a steam kiln, a fire must first be provided to heat the water and change it into steam. The steam in turn heats pipes or radiators in the kiln building. These pipes then heat the air that dries the lumber. The Christopher system heats the air and sends it into the kiln building to dry the lumber.

A pressurized furnace, fired either by natural gas or fuel oil, provides this heat. Automatic valves control the amount of fuel which in turn controls the kiln temperature. Automatic valves also control the amount of air admitted to the combustion chamber. While bringing the temperature of the kiln up to drying temperatures, a second set of valves are opened to assure fast



Close-up of a Christopher kiln operating at Gordon Grey Lumber Co., Sacramento, Calif., showing detail of steel conduit and upright pipes inside kiln. Curved pipe above furnace is connected to the blower fan which exhausts cooled air from the kiln and pressurizes the furnace.

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heating. After drying temperatures are reached, these auxiliary valves are automatically closed. Valves and burner are of well-known makes and are easily replaced or repaired, and so are the control equipment and motors.

The flame, under a pressure of approximately 15 lb. p.s.i., burns at almost maximum efficiency. The pressure is supplied by a blower fan which also exhausts cooled air from the inside of the kiln building. From the furnace, the air passes by a set of damper controls into a steel conduit which extends down the longitudinal center of the kiln building between the stacks of lumber. At regular intervals, there are upright pipes protruding from this steel tube which allows the heated air to enter the chamber between the two stacks of lumber. Directly above each of these pipes is a reversible fan which provides the necessary circulation.

Right here and now, let us explain how the circulation is accomplished in the Christopher kiln. There is air space all around the top and sides of the stacks of lumber. When fans are turning in one direction, the hot air coming from the upright pipes in the steel tube is forced to continue upward to the roof, where it is deflected both ways, across to the sides of the building, and then downward on the outside of the stacks of lumber. A pressure is built up here that is higher than in the center chamber between the lumber stacks; therefore the air passes through the boards in the stacks, back into the center chamber.

When fans are reversed to blow downward against the air coming upward through the upright pipes, pressure is built up in the center chamber and the air is forced through the stacks of lumber to the outside walls of the

HIGHEST QUALITY — MASS PRODUCTION

WOOD *Carving Machines*
AND AUTOMATIC PROFILERS

TOOLS SALSTROM SUPPLIES

CARVING
MACHINE COMPANY
4117-23 KINZIE ST. CHICAGO 24, ILLINOIS

kiln building, where it moves upward to the roof, over to the fans, then down again. Air passes through the stacks of lumber at an approximate velocity of 300 f.p.m. The air should move approximately this fast so as to set up a rippling motion which will cut away the air which otherwise would stagnate around the boards and slow up drying, as explained earlier.

Throughout the length of the kiln building, the air is being circulated in this manner. Fans should be reversed every six hours to assure uniform drying.

Fresh air is injected into the building all the time through a steel conduit. Cooled air is being exhausted from the building by the blower fan at the furnace end of the building. Since additional air is being added to the system for the burning of fuel, some air must be expelled from the system. This is done by means of roof ventilators. But most of the air is re-circulated, which means savings in fuel through low heat loss. The entire air content of the building is re-circulated and re-heated every three minutes in this system.

Thermometers not only record the temperatures throughout the kiln building, but also regulate the heat through electrical controls.

We have now established the control of heat and explained the method of circulation. But what about humidity control? We know that if the air is too dry severe damage can be done to the lumber.

One of the interesting features of the Christopher kiln is its positive and simple humidity control. We know that the air in the system is constantly being re-circulated through the furnace and back into the kiln. We also know that it takes oxygen to burn fuel. Here

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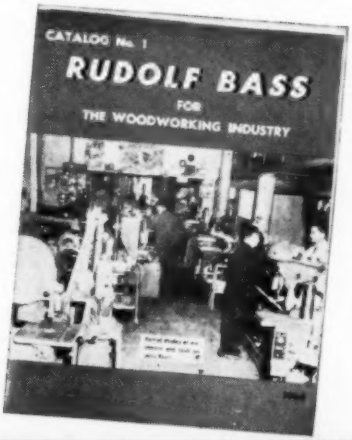
FOR WOODWORKING EQUIPMENT & SUPPLIES



RUDOLF BASS 173-177 LAFAYETTE ST. NEW YORK 13, N. Y.

is the answer to humidity control. In burning, the hydrogen from the fuel combines with oxygen in the air which forms H_2O, water. For instance, as a gallon of fuel is burned, a little over a gallon of water is made from its combustion. This new air enters the building with enough water vapor to prevent damage to the lumber as would be the case with extremely dry air. Also, moisture from the wood is added to the air in the system. It is necessary to furnish sufficient oxygen to permit combustion of the fuel. Since the building and the furnace are a closed system, the amount of air admitted to the system determines the amount of water-laden air which is to be released through the vents in the roof.

Humidity is set to a base control by manually setting the air vents in the roof, and the fresh air intake. Final control is by use of water sprays extending the length of the building. These water sprays are automatically controlled by wet bulb on the controller, acting on an electric valve.

The re-circulation of the air not only allows positive heat and humidity control, but also saves on fuel. Also, possible damage through carelessness and inexperience on the part of the operator is eliminated.

Too much emphasis cannot be placed on proper stacking of lumber. Stacks should be of equal widths and heights. Exterior gaps or protruding boards should not be present in any stack. In any kiln which has a circulation system, improper stacking will disturb the planned flow of the air and will cause green spots in the load of lumber.

When a local source of natural gas or fuel oil is available, Christopher kilns can be kept on a full-time production basis, running 24 hours a day, 7 days a week.

GAYNES UNIVERSAL

POWER FEED
MULTIPLE BORING MACHINE

CHECK ALL THESE FEATURES:
Individual ball bearing motor driven spindles.
Micrometer adjustment of each spindle for depth of bore.
Spindle capacity is 5/8" in hard wood, and 1" in soft wood to a depth of 3".
Variable power feed giving from 300 to 900 pieces per hour.
Power feed is arranged for continuous or intermittent operation.
2 spindle radial head to bore from 3/4" to 1 7/8" centers can be mounted on any spindle assembly.

Send for Complete Details

Gaynes ENGINEERING CO.
1713 W. Lake St., Chicago 12, Ill.
Phone: HAymarket 1-3061

The manufacturer who purchased the first Christopher commercial kiln has since then added four additional units and is drying approximately 1,500,000 feet of rough oak lumber per month. Burning diesel fuel, this user reports that total drying costs, including labor, fuel and other supplies (not including depreciation on equipment) amounts to approximately $5.00 per thousand feet board measure. One kiln is drying 4/4 rough oak, 90 to 120 days on sticks in 48 to 72 hours down to a moisture content of 6%; 5/8 inch rough stock for strip flooring, 60 to 90 days old, is being dried in 36 to 48 hours. One-inch rough pine lumber is being dried, green from the saw, in 72 hours. Degrade is reported at less than 3% on all species of wood. Other owners, depending on condition and species of wood, where natural gas is available at a cheap rate, report even lower drying costs.

The End

HARGRAVE TESTED TOOLS

The Cincinnati Tool Company's Catalog 49 fully illustrates the Hargrave Tested Tools such as clamps, cold chisels, punches, drills, etc., in a handy-order form. There are also list prices, suggestions for care and use of clamps, production tests for chisels and punches which will be useful for those using these hand tools.

Cincinnati Tool Co., Norwood, Cincinnati 12, O.

MEMBERSHIP DIRECTORY

The Association of Manufacturers of Woodworking Machinery announces the Membership Directory, which lists the manufacturers affiliated with the organization, names of company officials and types of woodworking machines they produce. Of handy pocket-size, it is sure to prove valuable to all in the industry.

Association of Manufacturers of Woodworking Industry, 505 Arch St., Philadelphia 6, Pa.

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WWD Finishing Section

Efficiency with a Conveyor System

by A. R. De Burgh

TO ANYONE familiar with wood finishing processes, increasing finishing department efficiency to the point where other processes are pushed to keep pace, is as improbable as the "man-bites-dog" type of newspaper story.

Yet this experience is claimed by some of the manufacturers who have installed the fully conveyorized finishing system developed by an ex-furniture manufacturer, A. R. DeBurgh. The same basic components are employed; actual construction and installation vary widely according to the needs of the individual manufacturer.

The story of the DeBurgh system begins properly in 1936, when the inventor's Bellingham, Washington, plant faced liquidation because of the dangerously narrow margin between profit and loss, a factor only too familiar to many manufacturers in the wood products field.

Costs had skyrocketed in 1936. Even a slight drop in volume meant financial hardship. Improved machinery helped some, but as other processes were made more efficient, the finishing department bottleneck became an even greater drawback. Money was being spent here for laborious hand operations and inefficient transportation methods, without adding anything to the value of the products.

Mr. DeBurgh decided to install a timed conveyor to take care of his finishing operations. Rather naively, as he expresses it, he began to consult various manufacturers of conveyor systems. They showed him beautiful pictures of beef carcases moving along in slaughter houses, apple boxes gliding smoothly into freight cars, bottles sliding down chutes in breweries—almost everything, it seemed, but varied items of furniture going through the many finishing processes required by the industry.

True, there were in use many quite successful adaptations of standard con-

Workmen need not leave their stations to finish all sides of the piece. The pallets on which the furniture rides can be rotated at the touch of a finger.

veyorized systems, but all of these had serious drawbacks because they were not basically designed for furniture finishing.

The survey revealed two facts: First, conveyor people apparently did not know enough about the needs of the wood products industry, and second, furniture manufacturers as a whole were unaware of the tremendous money-saving possibilities of timed conveyor systems.

Some of the main objectives and difficulties were listed about like this:

a) The industry needed a system engineered to meet its own peculiar requirements.

b) The system must be tailored to each individual plant and allow for wide variations in timing, spacing and size of products handled. It should also be sufficiently flexible to permit installation according to the amount and pattern of space available.

c) Transportation alone, while helpful, was not enough. The complete system must include adequate provision for forced drying and cooling, control of temperature and relative humidity, proper air exchange to reduce fire hazard, and, of course, spray booths or stations.

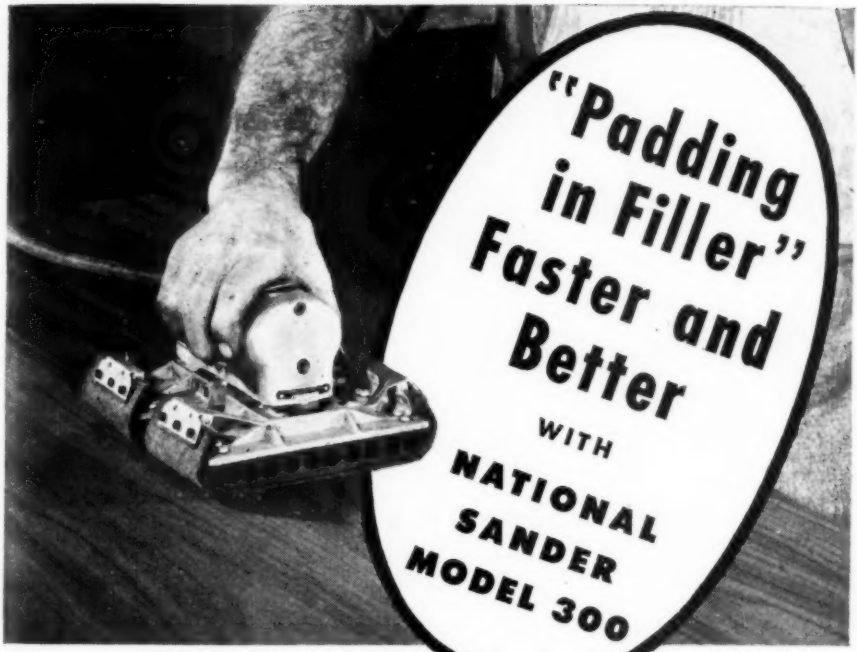
d) Entire layout should be compact, eliminating long lines whereon nothing is being processed or worked.

e) A floor-based conveyor would be preferable to an overhead installation because it would distribute the load equally over a large floor area and thus avoid reinforcement sometimes needed when overhead transportation is installed; it would also eliminate the danger of dust falling from the conveyor and damaging the finish.

f) Each piece being worked on should be completed without need for the worker to walk around it or otherwise leave his station.

g) Provision should be made for "close pack" in the dryers, to save space and time.

This line moves about five feet per minute, giving operator ample time for any spray operation.



National's Model 300 two-pad, reciprocating, straight-line action, air sander does a superior job with brushed on heavy fillers. Either molded rubber with felt overlays or felt pads should be used as padding. The Model 300 in actual operation has tripled production when used in place of hand filling . . . and has given a better finish. Each pad makes 2250 strokes per minute. National's Model 300, and other National Sanders, are excellent for rubbing, sealing, filling, as well as sanding on wood and other materials. Write for details today, or ask your mill-supply house for information.

National Sanders . . . The Complete Line of Portable Block Sanders

NATIONAL NS SANDERS

NATIONAL AIR SANDER, INC.
2820 AUBURN STREET, ROCKFORD, ILLINOIS

Heavy pieces are easily loaded on the DeBurgh conveyor with one pallet built on an air lift and positioned flush with the floor. This pallet is on floor at right of picture.

h) The system should have possibilities for expansion whereby various assembling and manufacturing operations could be performed prior to actual finishing.

i) Finally, the result should be a better product with more uniform, improved quality—produced in a cleaner, more efficient factory.

The first DeBurgh floor-based pallet type conveyor was more successful than anticipated, saving time, labor and money, resulting in better quality at lower cost.

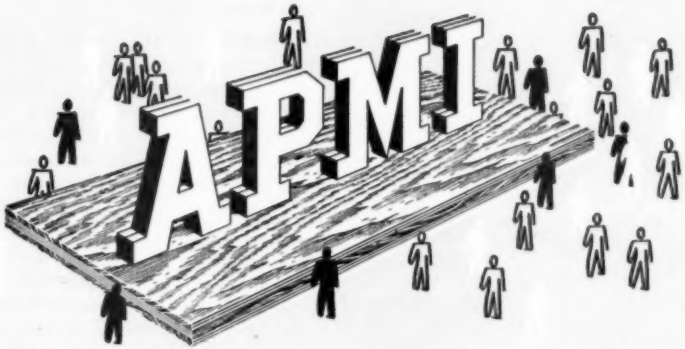
Wartime shortages prevented further expansion for several years, but after the war Mr. DeBurgh entered into an agreement with George Koch Sons, Inc.,* for the engineering, fabrication and installation of DeBurgh conveyorized finishing systems.

"Close pack" feature is illustrated. Pallets automatically swing 90° at the dryer entrance and are pushed together to save space. Travel rate is slowed by about two-thirds. Pallets separate again to normal working range as they leave the dryer and cooling section.

Space saving "close pack" feature of the system is shown with work in dryer.

The Koch organization, pioneers in the field of forced drying of furniture finishes, undertook to supply a complete service that includes everything from preliminary survey to final testing of the installation.

* Licensees for the United States east of the Rockies.



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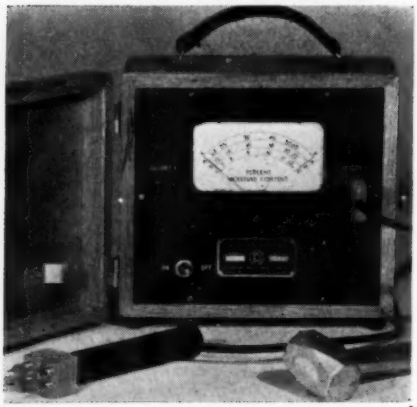
MOISTURE DETECTORS



QUALITY CONTROL MEANS IMPROVED PRODUCTION

To improve your production and have fewer rejects, maintain the moisture content of the raw material within limits. The model RC-1 **Delmhorst Moisture Detector** accurately measures moisture content from 5 to 65 per cent in all kinds of wood either rough or smooth. Readings are made directly on the meter — no dial or knobs to turn, no calculations required. Interchangeable electrodes for testing veneers, timbers, poles or other special tests are available.

FEATURES

Moisture content read directly on the dial — no knobs or switches to turn.
Large size, easy-to-read meter.
Small size — light weight can be carried on shoulder strap, leaving both hands free to handle the stock.
Long life batteries, last 6 months to a year.

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complete information . . .

DELMHORST INSTRUMENT CO.
112 Cornelia St. Boonton, N.J.

To date some 35 DeBurgh systems have been installed, with uniformly successful results.

Essentially, the system consists of a pallet type conveyor, with each pallet being fully rotatable so the work may be done conveniently and under best lighting conditions. The pallets ride on a ball-bearing castered track which has a chain drive in the center. Provision is made for the running of both large and small pieces on the same conveyor, with adequate spacing and time allowed for the required operations on each. Single pieces may be withdrawn from the line for unusual work, if required. Provision can also be made for stopping pieces temporarily for such operations as striping, applying decals, decorating, etc.

As the finished pieces enter the dryer, the pallets are automatically "close packed" to save valuable dryer space and time. The operation is reversed as they leave the dryer or cooling area.

In a complete DeBurgh installation the product is assembled, finished, cooled, rubbed, trimmed and packed for shipment with only one transfer of pallets. Thus there is no handling of the work from the machine parts stock to the shipping room, eliminating a vast amount of non-productive labor.

Each installation is individually engineered to meet the needs of the plant in which it is made. In some cases, transfers or elevators are used to move products between synchronized conveyors on separate floors; others may require double-decking for certain intervals, and so on.

In one installation, for example, the finishing room, crammed to capacity, was blocking progress in the mill and cabinet rooms. A conventional, stock type conveyor would have required 2164 feet of conveyor, necessitating expansion of the building. A specialized

ANOTHER *SERVICE STORY* FROM THE FILES OF **PLASKON**

THE RUDOLPH WURLITZER COMPANY

in the building of fine pianos
Plaskon Technical service plays a helpful role

Not only fine instruments, but beautiful and durable pieces of furniture—that's the constant aim of The Rudolph Wurlitzer Company in building its pianos. And by helping this user of Plaskon Resin Glue achieve its aim, Plaskon Technical Service has won another enthusiastic booster. "Most helpful", this company says of the untiring efforts of Plaskon field representatives to have them realize all of the advantages of Plaskon Resin Glue in their bonding operations.

Plaskon field representatives are skilled in gluing by training and by actual experience in woodworking plants. If they can't tell you how to avoid a problem, or give you suggestions on how to lick one that has developed . . . they will help you find the answer by going to work in shirt sleeves in your plant. Try this service—and Plaskon Resin Glue—for the most satisfactory bonding you have ever known.

Write for free descriptive booklet, complete tables of properties and technical information on Plaskon Hot and Cold Setting Resin Glues.

Plaskon makes a complete line of powdered and liquid resin glues for either high or low extension that are uniform in quality and stable in storage.

Practical Tips

FROM THE GLUE MAKER TO THE GLUE USER
on Selection of Lumber Cores

Mixed species should be avoided in choosing lumber cores. Pressure necessary to assure good surface contact between the more dense pieces may cause undue compression in the less dense wood. In addition, the two species will undoubtedly swell and shrink differently with changes in moisture content. Although Plaskon Resin Glues are, in themselves, highly water resistant, the wood itself is not substantially changed in its resistance to moisture absorption on drying out.

More complete information may be found in the Plaskon Glue Book

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FAMOWOOD is the all-purpose plastic that applies like putty. It quickly and easily fills holes and large cracks and users say it "stays under adverse conditions." It's an excellent product for fast, quality production. DRIES QUICKLY—doesn't shrink—sands easily—is waterproof and weatherproof when properly applied. . . . **Takes spirit dye stains freely.**

Let FAMOWOOD prove it can be a FOUR-WAY MONEY SAVER FOR YOU, TOO. 1—It helps increase production. 2—Cuts production costs. 3—Cuts down spoilage and waste. 4—Helps reduce labor costs. . . . **Put FAMOWOOD to the test—you'll put it to work regularly.**

In WHITE and 14 NATURAL WOOD COLORS: Fir—Mahogany—Walnut—Oak—Birch—Red Oak—Maple—Tupelo—Cypress—Cedar—Redwood—Alder—Ash—Red Gum.

Use FAMOGLAZE, too—unsurpassed for finishing fine hair-line cracks and minor defects. Non-shrinking—sands easily—leaves a smooth, porcelain-like finish. **IN SNOWY WHITE AND MAHOGANY.** . . . Both FAMOWOOD and FAMOGLAZE stick to any clean surface: tile—porcelain—glass—metal—etc.

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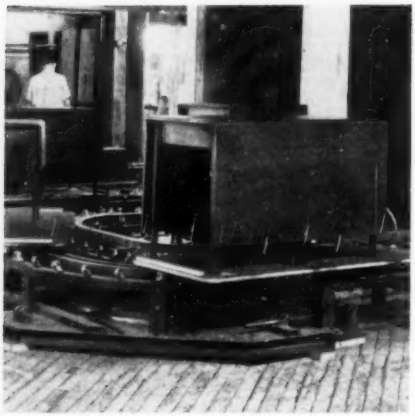


View of automatic spring tension conveyor chain take-up. This automatically provides proper chain tension throughout the system.

DeBurgh system, engineered to take advantage of existing facilities, resulted in a substantial increase in production—and the total length of the conveyor is only 1040 feet.

The DeBurgh system has been equally successful in both large and small plants. Factories producing only a few pieces of high quality furniture per day have found the system profitable, as well as those turning out hundreds of completed items in a single eight hour shift.

In general, advantages claimed for the DeBurgh system include:

Production at lower, controlled, costs.

A better product with more improved, uniform quality.

Better service to the retailer, which means the factory's product is on the dealer's floor for a greater percentage of the year, resulting in increased sales.

Faster turnover in inventory, and inventory reduction.

A cleaner plant.

The End

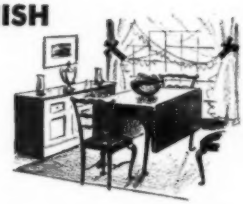
SAVE SANDING COSTS!

How Production-Wise Manufacturers
Save Time and Money with AP JEWEL ABRASIVES

BEATS PAR

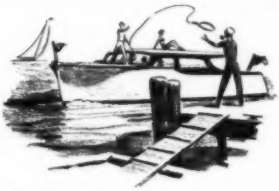
This prominent manufacturer of sporting goods had a problem finishing golf clubs. Tricky combination of wood and metal sent finishing costs sky-high. Finally switched to heat-resisting AP Bondite New Process Belts—says they outperform all other abrasives tried.

FINER FINISH



Much of the beauty of maple furniture depends on quality of finish. This manufacturer, dissatisfied with results, found AP Jewel Garnet Endless Belts did faster work than previous abrasives — gave finer finish at same time.

8 TIMES LONGER WEAR



Torn covers on drum sanders were causing costly slowdowns finishing plywood sheets for this boat manufacturer. AP representative recommended change to AP Bondex Garnet Fibre. Manufacturer now reports, "These AP drum covers last 7-8 times as long as former abrasives".

Facts like these from manufacturer after manufacturer tell a story you can't afford to ignore. Find out what Jewel Abrasives can do for you now! See your distributor or write us today.

Abrasive Products, Inc.

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You demand FULL POWER UTILIZATION?

The Irvington-Hill with its motor-on-arbor design eliminates all belts and pulleys. The 5 HP 3600 ball bearing electric motor of small diameter size gives maximum cutting capacity with the smallest diameter saw.

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The Irvington-Hill is both automatic and semi-automatic. For controlled or selective cutting...the operator is in complete control of the machine...interchanging from one type of feed to the other with no time or labor loss.

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The Irvington-Hill with a range of 40 to 90 cuts a minute, ample to handle the fastest production line...it's considered the fastest cut-off saw on the market!

The IRVINGTON-HILL
Automatic and Semi-Automatic
CUT-OFF SAW
that has increased production 35%

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Irvington Machine Works
Dept. 5, Portland, Oregon
for Illustrated Brochure

IM-109

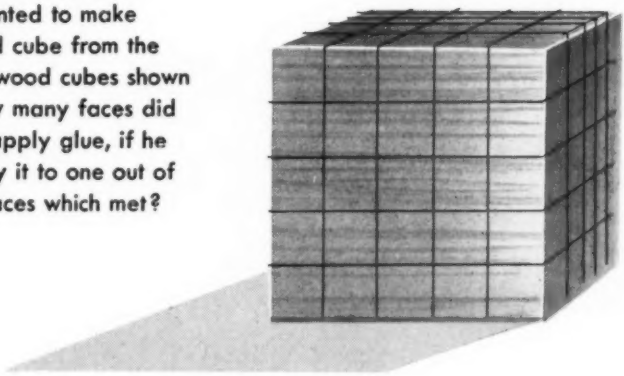
G. I. TRAINING EXPIRES

Word comes to us to advise all veterans that the G. I. training program will expire July 25, 1951. Every veteran who wishes to take advantage of his educational opportunities must start his training before this date!

If you have put off your training, we urge you to apply immediately for the course you've postponed. Of course, we are particularly interested in seeing more and better trained men in the woodworking field. Write to us if you are interested in some phase of this industry.

Executives and management please note also. Has your concern taken advantage of the G.I. Bill? Your men can be better trained, and at no cost to you, if they are taking correspondence courses while working at your plant.

A certain manufacturer of furniture wanted to make a large solid cube from the many small wood cubes shown here. To how many faces did he have to apply glue, if he had to apply it to one out of every two faces which met?



UFORMITES 505 and CB-553 may be the answer to your production puzzles. These powdered urea resins give strong, durable bonds, are non-dusting, provide fast "snap" in the hot press, permit you to use economical mixes, assure uniform pot life, good spreadability, and ease of handling. And UFORMITE JS-508—new one-component adhesive for edge gluing—eliminates complicated mixing as well as taping and gives you a wide range of assembly times.

Next time your Rohm & Haas representative calls, ask him about the complete line of UFORMITE, AMBERLITE and TEGO adhesives. If you say so, he will work with you—right in your plant—to find the answer to your bonding puzzle.

If you give up on the puzzle illustrated above, you will find the answer on page 178.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company

UFORMITE, AMBERLITE, TEGO *are trademarks Reg. U. S. Pat. Off. and in principal foreign countries.*

Models to suit . . .

EVERY PURSE *and* PURPOSE!

HIGHLIGHTS OF THE JW-250 *Shown above:*

Extra large tables — solid or sliding section. 43-inch ripping capacity. No build-ups required for working large parts.

Will accommodate saws up to 20" dia. — cut through 6 inches of stock.

Accommodates dado heads up to 4 inches wide.

Equipped with left section sliding table (ball bearing), if desired.

Dust-free, cool-running motor (flat top for greater sawing capacity).

Absolutely accurate tilting mechanism with automatic take-up for wear.

Synchronized brake pedal and push button control. Pressure lubrication, dust arrester, finest gauges, ripping fence and many other outstanding features.

REGARDLESS of the size or nature of your operation or the size of your budget, there's a Tannewitz Tilting Arbor Mitre Saw Bench that will fit your requirements exactly and give you the greatest dollar for dollar value obtainable

In addition to the JW-250 — top model in America's top line of Mitre Saw Benches — there's the others in the "J" series of Mitre Saw Benches: the "J-250" with standard size top, the "JS-250" similar to the "J-250" but having a sliding left section top; the moderately priced "XJ" series with five table variations to promote the maximum of efficiency for each and every production set-up, and the "U" series for those who want tilting arbor mitre saw benches at the lowest price consistent with quality When you buy a mitre saw bench it is wise to get a "TANNEWITZ." For more than 50 years this name has been synonymous with the finest in sawing equipment and recognized as such throughout the nation. Write for bulletins We will be glad to aid you in the selection of the best machine for your particular requirements.

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WOOD Industry Notes

FINISHING SCHOOL

This group, recently enrolled at the DeVilbiss Company's school of spray painting, assembled for a photo at the Company's plant. The school schedule for the remainder of this year offers a week of instruction in industrial finishing beginning on any one of these dates: July 31, August 21, September 25, October 30 and November 13. Enrollees pay only for meals and lodging while attending school, there is no charge for instruction.

DeVilbiss Co., 300 Phillips Ave., Toledo, Ohio.

• • • • •

TECO MILPAK COURSE

The Timber Engineering Company's first and second training courses in the manufacture of Milpak and low grade hardwood utilization have attracted representatives of progressive companies from all parts of the country.

The course is predominantly practical and the trainees are taught how to determine the yields of usable material from different grades of lumber and how to manufacture and bundle Milpak. All of this work is done under the direction of Teco laboratory experts. Processes include the grading, cutting, drying, packing and marketing of Milpak, a new product created from the lower grades of hardwood lumber offering maximum industrial utility.

Complete information and application blanks for enrollment in the August 21-25 course in Milpak and lower grade lumber utilization will be furnished on request to C. A. Rishell, director of research, Timber Engineering

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IRON MOUNTAIN - MICHIGAN

Co., 1319 18th St., N. W., Washington, D. C.

SOUTHERN PLYWOOD MEETS

Members of the Southern Plywood Manufacturers Association met in their Fourth Annual Meeting at the Henry Grady Hotel in Atlanta, Ga., May 9, 1950.

The southern panel makers elected J. J. Stern of Greenville, Fla., association president and B. E. Bryan of Calypso, North Carolina, vice-president. Mr. Stern is president of Southern Plywoods, Inc. and Mr. Bryan is manager of Calypso Veneer Co.

Board members named include B. P. Adams, Jr., manager of United States Plywood Corp., Orangeburg, S. C.; D. E. Nichols, president of Valdosta Plywoods, Inc., Valdosta, Ga. and Jack Ramsey, manager of Darlington Veneer Co., Darlington, S. C. C. W. Dietterich of Atlanta, Ga. was re-elected managing director.

WILLIAM D. DISSTON

William Dunlop Disston, retired vice president of Henry Disston & Sons, Inc., nationally known tool and saw manufacturer, died May 22 at his home in Chestnut Hill, Pa. He was 62. Prior to the illness which forced him to retire in 1946, Mr. Disston had been active in civic and political life in Philadelphia. He was a grandson of Henry Disston, founder of the Company.

BLAIR GENERAL MANAGER

Keith C. Aldrich has been appointed general manager of the Blair Veneer Co., North Troy, Vt., and of its subsidiary, Vermont Plywood, Inc., Hancock, Vt. In his new capacity, Mr. Aldrich will have responsibility for log procurement and other purchasing, production, sales, accounting and all other administrative functions.

"When you admit you're wrong, it's a sign you're getting wiser."

—The Sphinx

Appointments

Aetna Plywood has added **J. C. "Chet" Thomas** to its sales staff. He will do special trade contacting to develop users of plywood and veneers in the Chicago metropolitan area. With 29 years of experience in the woodworking industry, he is familiar with the machinery as well as plywood and lumber.

Jack Love takes over as Disston sales representative in their southern territory. **Grover C. Black,** who has been working the southern territory will now spend all of his time on wood-

Jack Love

Grover C. Black

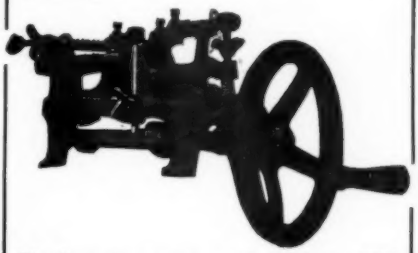
working tools. He will be a specialist on all problems requiring circular wood saws, log band saws, cutter heads, etc. Henry Disston & Sons, Philadelphia 35, Pa., manufactures a complete line of saws, knives and cutter heads.

O. A. Moore is now assistant sales manager of Wetzler Clamp Co., Long Island City, N. Y. He will be in the New York office. **John H. Small** has been appointed western district manager with headquarters at 440 Seaton Ave., Los Angeles, Calif. A stock of the Wetzler clamps is maintained in the western office.

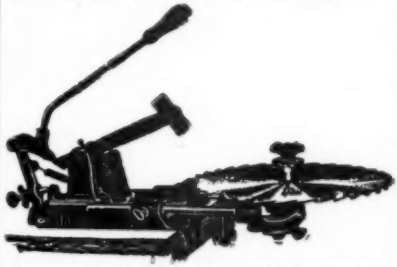
THE SIMPLEX

Circular & Band Setting Machines. The most simple and practical machines made.

Will fit your saws better and more accurately and in a fraction of the time required by the obsolete method of hand setting.



Simple yet accurate and efficient. Will do more and better work than any other machine of its kind.
The vise takes saw blades ⅛"-1½" in width and by automatically gripping the saw while tooth is being set, prevents twisting of narrow saw blades.
The feed finger is adjustable to teeth with ⅛"-⅝" spacing, point to point.
A saw can be set in 4 to 5 minutes.



An excellent tool for setting circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

To obtain the best results the teeth should be properly and evenly set.

Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

Write for complete information

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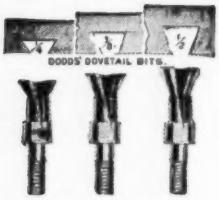
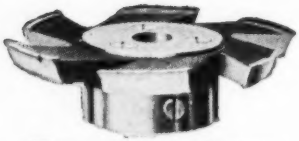
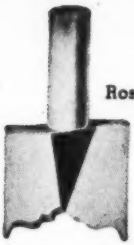


Dovetail Cutters

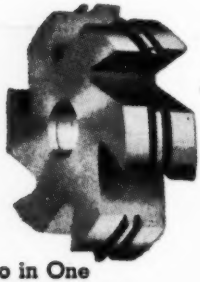


Champion Cope Cutters



Rosette Cutters

Carving Machine Cutters



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Glue Joint Cutters

HARD TO GET ? No!

Plug Cutters

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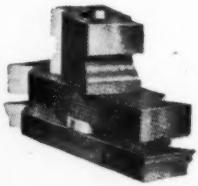
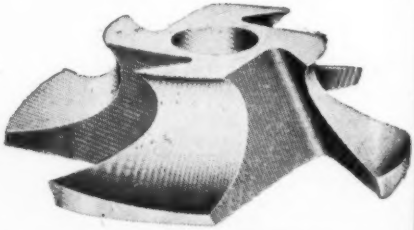
Champion Check Rail Cutters

Champion Shaper Cutters



Sash Cutters



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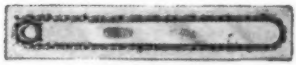

Mortise Chains

Adjustable Fly Cutters

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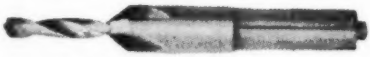
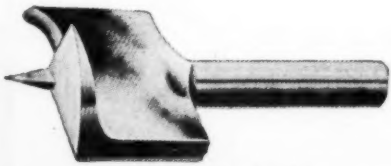
Mortising Chisels

Machine Bits



Taper Countersinks

Turning Chisels



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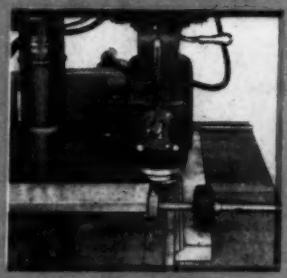
WOODWORKING MACHINES . . . . TURN PAGE

New! DeWALT
SAFETY POWER FEED!

POWER FEED RIP



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POWER FFED RABBETING

Here's a POWER FEED that you can own and operate at surprisingly low cost!

This Power Feed can be attached to any DeWalt machine quickly, and lifted out of the way, in a matter of seconds, leaving machine free for all the 101 DeWalt operations.

The Safety Power Feed is equipped with live rollers for both the in-feed and off-feed ends of the material. It can be adjusted for speeds up to 120 ft. per minute. It holds material firmly against the fence to insure accurate cuts—is adaptable for different thicknesses of material.

Most Power Feed Rip Saws can handle lumber *only* in a straight rip position. DeWalt's Power Feed can be used also to bevel rip at any angle, plough, groove, rabbet (straight or at an angle), shape and run mouldings.

Remember, this is a complete power feed unit, including motor, switch, 3-speed drive and hinge mounting for attaching.

The price is amazingly low—only $199.00 f.o.b. Lancaster, Pa. *Just 80 cents a day over a year's period.* If you do not own roller extension tables, one pair of rollers may be secured for $12.50 additional.

Write for full information about this new Power Feed now. DeWalt Inc., 47 Fountain Ave., Lancaster, Pa. Subsidiary of American Machine & Foundry Co., New York City.

DeWALT

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EQUALIZING TABLE SLIDES

Wabash Folding Leaf Equipment Pleases Buyers

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COMPLETE TABLE SERVICE

WHATEVER your extension table problems may be . . . Wabash Slide Engineering Service can help you. If you want smoother operation, easier up-fitting, or unique features for your new patterns, consult Wabash. Have their construction styled by specialists at no extra cost. We manufacture slides with or without equalizers, complete folding leaf equipment, steel slides for porcelain top tables, and top locks.

B. WALTER & COMPANY, INC., WABASH, INDIANA

Walter of Wabash

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- Afloat in Plywood
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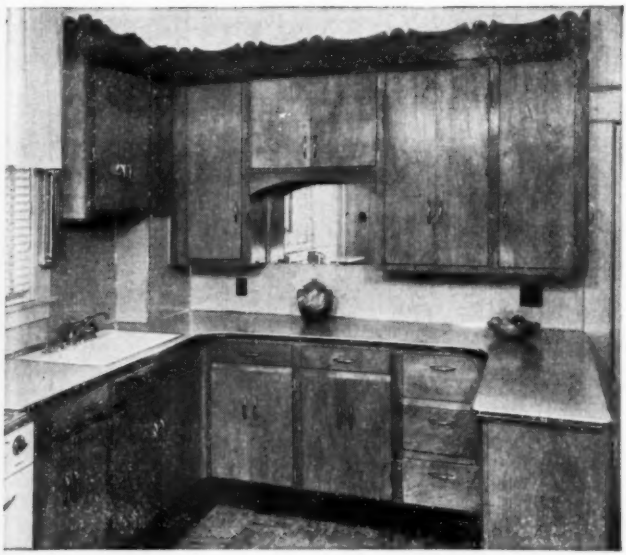
Guaranteed to . . . STAY FLAT

AETNAPLY BIRCH CUPBOARD DOORS



Bring out the beauty of Birch with natural finish on Aetnaply Doors.

¾" 5-ply

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Good 2 Sides

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True Corners and Edges

Save Money and Reputation . . .

Cut down your manufacturing costs and avoid on-the-job replacements by using AETNAPLY Birch Cupboard Doors — GUARANTEED to Stay Flat.

Special fabrication of scientific core construction of edge-grain plywood . . all four edges lumber-banded to allow ample trim and solid base for hardware, make AETNAPLY Doors "tops". Aetna also has regular 4' x 8' panels of Birch, White Pine, and Fir . . . send in your specifications for quotation.

Write for folder, "Aetnaply Cupboard Doors", of prices and sizes.

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Many times this has happened as a result of the careful laying out of storing and shipping facilities plus the use of fast, modern handling equipment. This extra service has meant a great deal to customers who needed veneer "Right Now". Why don't you take advantage of the extra hours that can be saved? Time is priceless.

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Application of *radio-frequency* Tooling

by Jack B. Cunningham . . .

THE MOST successful application of radio frequency to wood fabrication has been carried out by millwrights, cabinet makers and woodworking machine operators. For the past seven years these men have witnessed engineers and technicians design and build radio-frequency tooling. This paper deals with applied knowledge of general shop practice, wherein an understanding of a complete process for the manufacture of a given product is more essential than all the technical curves and formulas. Knowledge of this nature cannot be gained in the laboratory. Close coordination with the production men in wood fabrication plants will ascertain the value of the radio-frequency tooling and point out the changes necessary to meet their standards. The knowledge of tool design requirements and manufacturing techniques among the wood products manufacturers and personnel is of a greater scope than that possessed by all the combined woodworking machine manufacturers and electronic technicians. Therefore, it is imperative to acquire the assistance of the proposed user before fabricating a radio-frequency generator and press for a woodworking operator. Applied knowledge of shop practice consists of quality control of standard procedure. Proper kiln drying, stress-free lumber, humidity and temperature control and glue room technique are a few of the essential procedures. Control of glue application to wood of correct moisture content is equally as important as presses and tools to apply adequate pressure. Electrodes should be correctly coupled to the radio-frequency generator and a correct frequency and power output with proper voltage applied to glue of known and tested characteristics.

The principles involved in applying radio frequency energy to a specific tool require a time study to justify the expenditure of time and money. The most important step before installation is a time study of the fabricating operation contemplated. In many instances, a radio-frequency tooling installation adds cost to the article produced. A tooling engineer should start his survey with the dry kilns to see

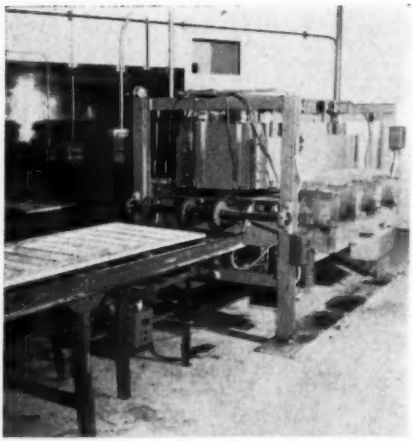


Fig. 1. Door core coming out of assembly magazine.

that a schedule in a properly designed kiln is followed to assure the fabricator that no case-hardened, honeycombed or warped lumber will go into the assembly. Maximum dimensional changes during and after manufacture can be controlled. The re-sawing, milling of lumber and preparation of dimension stock can then be assured at a lower cost. When the temperature in the lumber storage and fabricating rooms drops below 70°, gluing of wood with synthetic resins should not continue. Therefore, a conditioning room with proper temperature and humidity should be used before fabrication.

Satisfactory methods of designing and making tools for wood fabrication will be dealt with on each individual subject.

Hollow-Core Flush Doors

Hollow-core flush doors consist of many designs and necessitate different construction of assembly jigs for the core fabrication. The non-glued assembled core of a flush door of one type is shown in Figure 1. Stiles are mortised in a sticker. Lock rails, intermediate

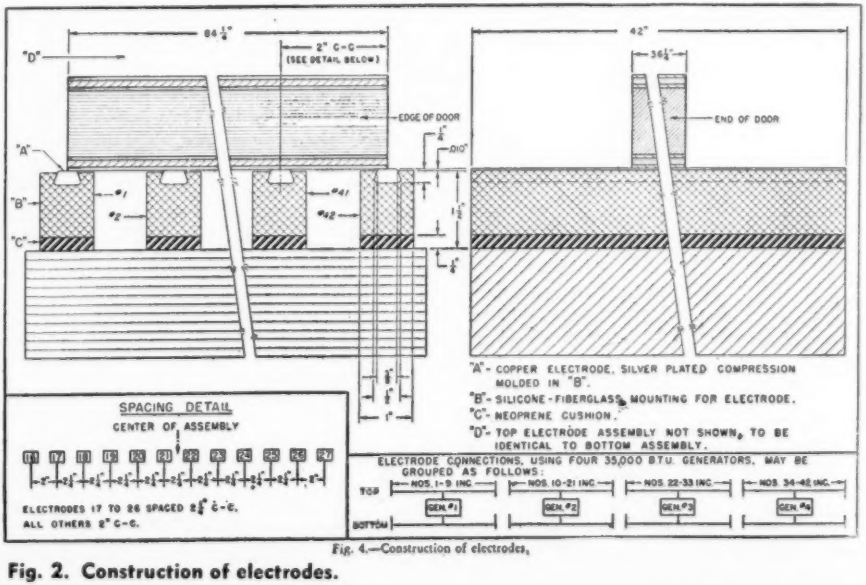


Fig. 4.—Construction of electrodes.

Fig. 2. Construction of electrodes.

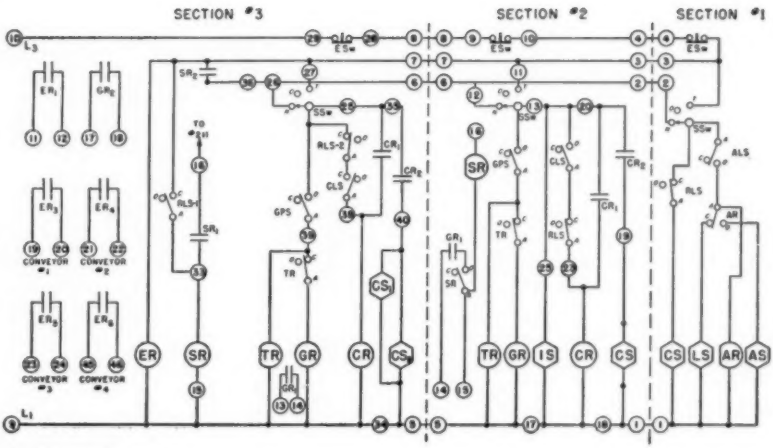


Fig. 3. Control circuit.

and top rails are machined to a tight fit with a double-end tenoner. Conveyor belts move the stock from a conditioning room to an automatic hopper and magazine press. Stiles, rails and lock blocks are pressed together by a hydraulic cylinder, when a timer switch actuates a solenoid controlling the hydraulic valve.

With release of the hydraulic press, the divided table bed lowers the door frame onto a powered belt conveyor. The conveyor belt is on a plane level with the center opening of the double-roll glue spreader, into which the door core is propelled and thence onto a quarter-inch plywood panel. A powered roller conveyor is used to carry the sandwich construction to an automatic squaring and spotting press in the conveyor line.

Six individual one-kilowatt generators are used to spot cure ten square inches of glue line area on corners and center, while air cylinders apply pressure in three directions to square the door. A time delay releases the air cylinder, allowing the squared door to drop onto continuous powered rollers. The final high-frequency curing press is operated by air pressure with multiple fire hoses. A storage tank of 60 cu. ft. capacity, at 100 lb. pressure, is connected to the input by solenoid-actuated control valves which allow the press to close in one second. Similar valves connected to the exhaust release in the same time.

Electrodes

Electrodes are fabricated as in Fig-

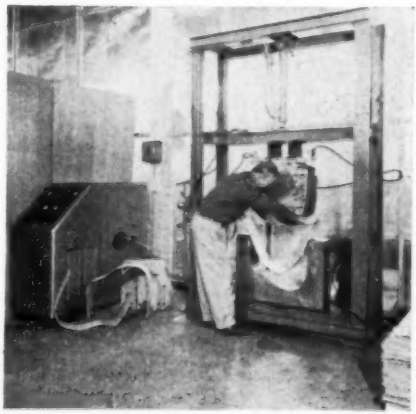


Fig. 4. Inserting veneer into die.

Pictured First Page This Section.

A child's bedroom paneled in Plankweld. Sliding plywood wall permits closing off bedroom from rest of house. Desk, table, chair also feature plywood. This is part of a plywood exhibition held at the Museum of Modern Art, New York City.

ure 2. They are constructed of fiberglas and silicone resin under pressure, with a silver-plated copper electrode imbedded in the resin but allowed to project above the silicone and glass 0.010 inch to eliminate all air gaps between the electrode and face veneer. A slight air gap is allowed between silicone electrode base and adjacent electrode to prevent radio-frequency losses into the caul board. Silicone glass and electrodes are mounted on neoprene bases to allow take-up in uneven surfaces. The flow of door assemblies into the third press is controlled by a micro-

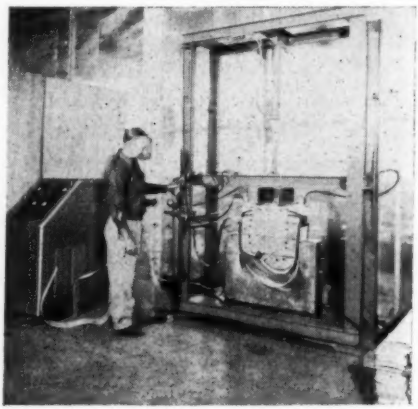


Fig. 5. Bringing down punch.

switch contact located 12 inches in from the outlet end of the press. Ten doors are necessary in the press line to start the full automatic cycle, which repeats itself by time delay and electronic timers every 30 seconds. It is necessary to use knurled conveyor rollers to convey each door, butted against the next door, onto the final curing radio-frequency press. As the sandwich assembly starts in motion, it is necessary to drive the interposing conveyor line to higher speeds. The conveyor moving the assembly into the squaring press travels at 50 f.p.m. The speed out of the squaring press is 60 f.p.m. Spring-loaded ceramic rollers inserted between electrodes allow the doors to travel onto the radio-frequency press at 60 f.p.m, propelled by adjacent doors. The door is stopped in exact position by the one-second closing of the press. A micro-switch control located within the press, one foot from the outgoing end, stops the door in the selected position when the door is travelling at one foot per second. An outgoing power conveyor, moving the door to a high-speed profiler, necessitates travel at 150 f.p.m to move the completely cured door out of the radio-frequency press before subsequent closing on the following door.

All movements and control switches are tied in and synchronized to four 34,000—B.T.U. radio-frequency generators. The electrodes in a horizontal line are alternately connected to the generator leads. Curing of a smaller area of glue line with each generator allows a higher frequency to be used and a greater amount of power can be applied to the ends of each door. Where glue squeeze-out occurs, it is cured only by conduction from the adjacent heat of

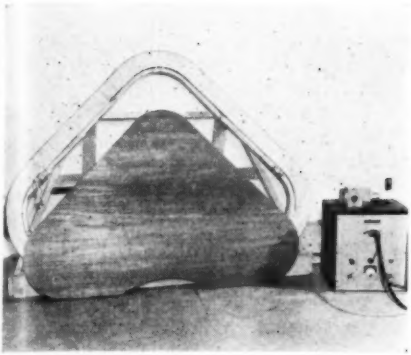


Fig. 6. Edge banding jig.

the glue line.

Figure 3 is a control circuit for this assembly operation. The magazine hopper press with modification of design, will assemble various type core assemblies, including the paper ring, lattice design, and honeycomb paper core.

Bent Plywood Furniture

Through the development of high-frequency equipment, bent plywood furniture now is being produced in mass production quantities. Single and compound curvatures have become standard production items, high-frequency equipment enjoying the added advantage of forming the plywood and molding the curvature in one quick operation. Thus, in furniture making, we have become accustomed to seeing the arm and leg of a chair formed together in one continuous piece of plywood, the back and seat curved from another.

The plywood is conditioned and cut to rough dimensions. The finished plywood can consist of either hardwood veneers throughout, or the core can be formed of lower cost veneers and faced with mahogany, maple or other decorative hardwood veneers.

Before placing in the press, every other piece of veneer is run through a double-face glue spreader. Then the veneers are arranged properly and inserted into the die (Figure 4). A punch made of laminated hardwood is raised and lowered with an air cylinder (Figure 5). The press is constructed of channel steel of sufficient strength to stand the pressure required. The cross member on the press, which the air cylinder activates and to which the die is attached, is locked into position at the bottom of the stroke by dogs which are welded into the main press frame.

The fluid pressure then is introduced between the punch and die face, using ordinary fire hoses, which travel up and down with the punch, for pressure. The hoses are connected to a conventional air-pressure line.

The die is made of hollow Kirksite and is filled with a heat-transferring oil. This oil is brought to a minimum of 150° F. by using a resistance heater suspended inside the die. This conditions the die so it will not absorb any of the high-frequency energy during the curing cycle when the die is cold. It maintains its own heat after an hour or so of operation.

The die acts as one electrode; the other electrode is made of segmented

Fig. 7. Assembly jig for venetian blind valance.

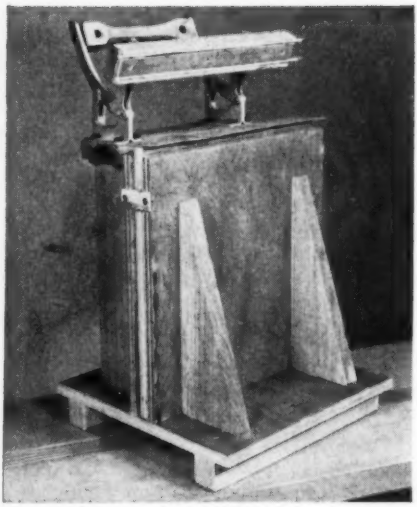


Fig. 8. Book-end type jig.

copper cemented to a special neoprene band to allow for expansion and contraction, and also to keep the pressure on the back of the veneers in a uniformly fluid condition. This electrode is completely insulated from the rest of the press frame and die.

Of a universal type, the press can be fitted with different shaped dies which are easily interchanged.

On an operation such as described above, a 10-kilowatt high-frequency generator is used. The curing cycle is very rapid, the actual time depending on the thickness of the finished bend. The controls of the press can be made completely automatic if production warrants such a move.

Edge Banding

Edge banding has been speeded up in the woodworking industry by the introduction of high-frequency machinery. The first step in edge banding the modern desk (Figure 6) is to place the table top in the jig, which centers it by locators holding it in position and away from the electrodes. The glue is spread on the veneer banding, which is then slid into position between the electrodes and the desk edge preparatory to curing. The banding is properly located by stops mounted on the jig. The electrodes are imbedded in a silicone glass fiber laminate. The face of the laminate acts as the pressure shoe on the bending. The pressure is introduced with a single 1¾-inch fire hose attached to a conventional air-pressure line, the hose being located back of the glass shoe and following completely around the periphery of the desk. The jig is so constructed that it brings the pressure first to the peak or top of the desk edge and gradually follows around to the heel or bottom in a wrapping motion, avoiding all possibilities of wrinkling or looping the veneer.

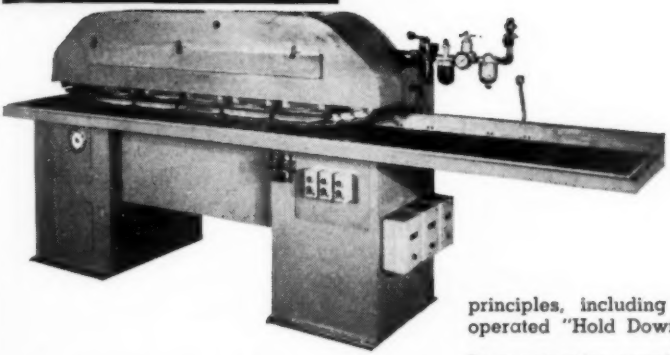
The operation can be accomplished with a small portable woodwelding generator. The jig is made with a foot-kick lever for unloading after the cure has been completed.

Venetian Blinds

In setting up jigs for the manufacture of venetian blinds by high-frequency methods, two welding heads, in which electrodes have been embedded, are mounted on a specially constructed

Fig. 9. Cutting off core stock.

WHY NOT TRY THE NEW CONTINUOUS FEED VENEER JOINTER



Our New Continuous Feed Veneer Jointer we believe is far superior to any continuous Feed Veneer Jointer heretofore made.

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bench or horse (Figure 7). The top is made of two parallel 2 by 8-inch boards running the full length of the bench. The boards are spaced so as to form a slot down the center, allowing the two heads to slide up and down the entire length and to be locked at any point to accommodate any length of venetian blind cap desired. The heads are made to receive all three parts forming a venetian blind—the facia board, the return and the cap. The return and facia are usually assembled with a 45° joint. All three members are then held in place on both ends of the assembly unit under toggle clamp pressure during the curing cycle. A one-half kilowatt woodwelding generator has sufficient power to cure the lines in such an operation.

Drawer-Front Paneling

In order to use up small pieces of panel which accumulate, many furniture plants use the pieces to make drawer fronts. The exposed edges of the laminations are covered with 1/28 inch veneers, the glue joint being cured electronically. This is done with a simple electronic jig (Figure 8). The panel is held vertically between the book-end type locators. The glue is spread either on the surface of the banding veneer or on the laminated edges of the panel, according to convenience.

The toggle clamps are mounted on a thin layer of hydropress rubber for flexibility. The stray-field electrodes are mounted on a wooden bar connected to the clamps and are separated by a piece of mycalex insulating material, which acts as the pressure shoe when the clamps are actuated to hold the veneer band tightly.

The curing is accomplished by the use of a small portable generator, assisted by a tuning unit constructed of a variable condenser and tap switch. This equipment allows a rapid change

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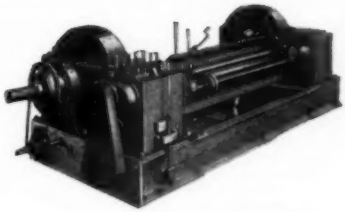

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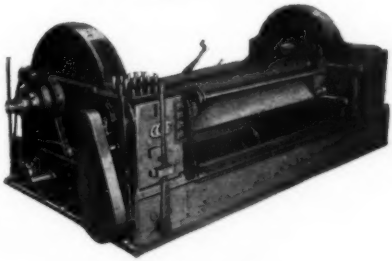
Here is a modern lathe embodying special features for high speed production of quality veneers from medium sized logs.

Built in 48" swing and with various knife lengths.



for LARGE LOGS

Quality veneer is cut from extra large logs on this modern large swing lathe.

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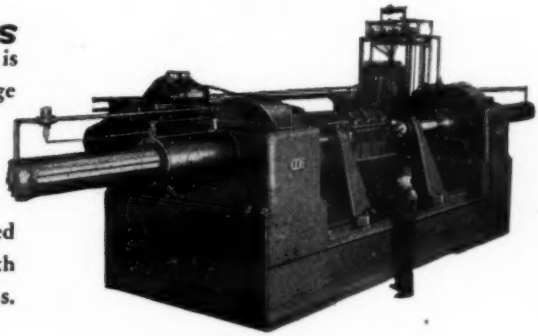

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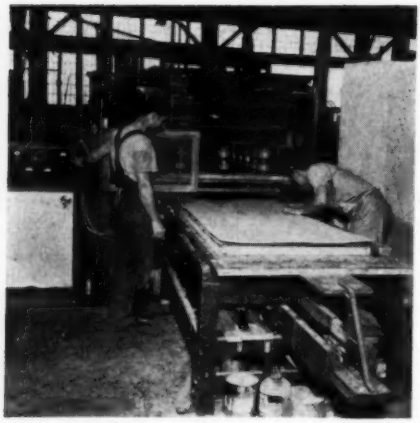

Fig. 10. Veneer press.

to large or small areas.

Flush Doors

Making flush doors in the conventional method entails considerable labor. After the milling, the material is layed up to the proper width and cut off to length (Figure 9). It is then put through the core stock press and bonded. From there it goes to the planer for cleaning up both sides. Then the core is moved to the glue spreader where the cross banding and face veneers are applied, then to the veneer press for final curing (Figure 10).

A newer and much faster method of manufacturing flush doors has been devised, wherein material which has previously been surfaced on both sides is put through a straight-line rip saw and then directly through a vertical glue spreader. This flush door welder is so constructed as to allow a continuous flow of core stock through the machine. The stock is cut to length as it leaves the welder. It is stacked near the machine until the entire batch is finished and then goes through the same machine for applying cross band and face veneers to the core (Figure 11).

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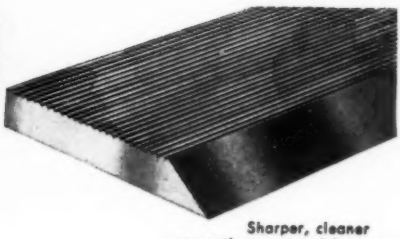

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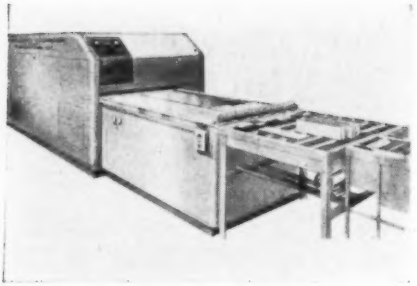

Fig. 11. Flush door welder.

Silicone-glass pressure members are inserted in the air-gap spacing to assure adequate pressure during the heating cycle, when cross band and face veneer are bonded to the core.

Since the glue line presents a lower resistance to the RF field, the major portion of the current follows the glue line in cross band and face veneer. This action is also accelerated by the placement and connection of the electrodes in such a way that the RF field through the core stock is a small percentage of that which flows through the glue line.

The electrode assembly is driven from a balanced circuit so that there is no actual ground used on any electrode.

The electrodes along the horizontal line are alternately positive or negative to each other, but at any instant the alternate electrodes are the same RF voltage above ground. This minimizes the unwanted stray radiation and further aids in confining the field to the glue line.

Prefabricated Houses

After milled components have been cut to their proper lengths, they are brought to the subassembly section. Multiple jigs are installed in sufficient numbers to meet the production requirements. The high-frequency elec-

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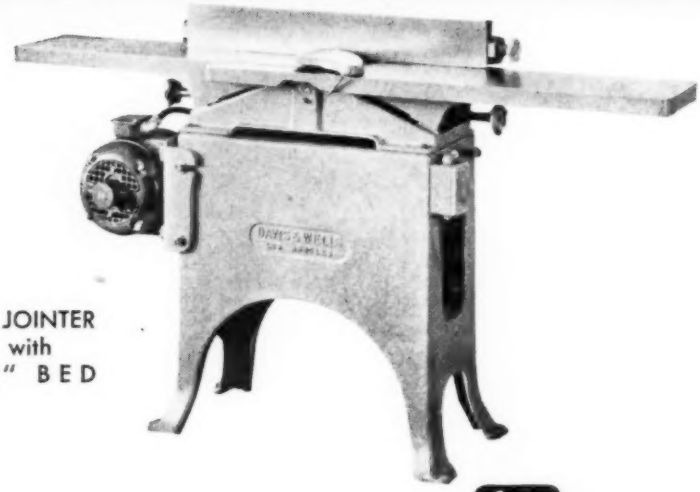

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trodes are built in as an integral part of the pressure system. After these subassemblies are bonded they are placed on the overhead conveyor line, which moves them to the major assembly jigs. Here the high-frequency is automatically applied to the area to be cured in the same manner as the smaller jigs.

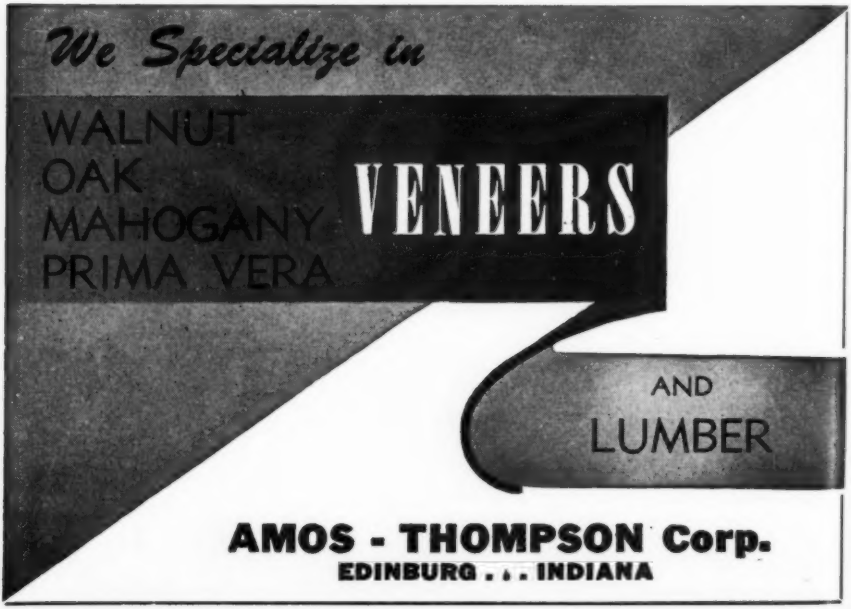
The final presses are automatically controlled and synchronized with the rest of the line. Their only function is to electronically bond the panel to the fully assembled frame sections.

After the stressed skin panel is bonded to the core, it is run through a high-speed profiler to obtain the exact dimensions which are required for fast final assembly of the house. Following this operation, the complete panel sections should be properly sealed to prevent moisture take-up, assuring the tolerance necessary to make possible the installation of the keys which lock the adjacent sections in place.

The vapor barrier within the stressed-skin panel should be taken into consideration if radio frequency is going to be used, since various types of insulating materials absorb a great amount of RF power.

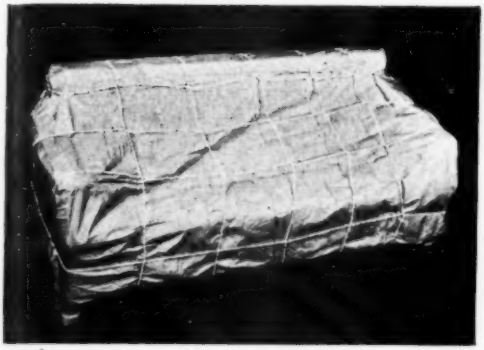
The success of these steps is closely dependent on the ability to enforce, within the plant, strict quality, temperature and moisture control, as well as proper inspection of incoming material.

Synthetic resin glues should be chosen very carefully for the job. A room temperature or intermediate temperature thermo-setting glue will be found best for fast cure at lower power requirements. Curing time for some assemblies will be reduced by using a partial cure to create sufficient bond strength to permit handling, and then allowing the balance of the cure to



CONSOLIDATED FREIGHT CLASSIFICATION

METHOD 17 F



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take place at room temperature. Assemblies of this nature should be stored in a heat controlled and humidified room until equilibrium of moisture content is attained.

Resorcin, phenol, melamine and melamine-urea will produce a long-life, boil-proof bond. The catalyst used in each type resin should have a high or low conductivity based upon speed of cure required. An electrolyte in the resin is advantageous to fast curing, but many disadvantages occur to offset the good features. Arcing when electrodes are in contact with the glue line, and high heat in ureas causing low strength bonds (Reference: Tests performed by Bror L. Grondal, Professor of Forestry, University of Washington) are only a few of the difficulties encountered.

When urea is fortified with melamine, a strong electrolyte can be used without harm to the glue for a rapid cure. Acid-type phenol resins have proven satisfactory for long pot life and fast cure.

Resorcinal glues usually flow easily when heated, thus causing considerable squeeze-out which will arc upon contact with the electrode. Resorcinal and ureas with high solids have the advantage of creating strong bonds with low pressure and thick glue lines, provided high temperatures are not applied.

Wetting agents can be used to advantage where a B-stage resin is allowed to precure and a low conductivity is encountered in the volatile free resin.

Numerous methods of electrode design, spacing, applied voltage, frequency selection, insulated electrodes and tuning stubs will be applied by each generator manufacturer and engineer; but all lead to the same result, with a sat-

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isfactory low cost wood product obtained.

Conclusions

The technical knowledge gained from actual research and practical experience within the Forest Products Research Society group, dove-tailed with allied fields in wood utilization and fabrication industries, will bring forth a demand from the entire world for superior, lower-cost, long-life wood fabricated products and new methods for making them.

Based upon the demand, dielectric tooling and radio-frequency generators will be low in cost, tremendous in demand, and simple to operate.

This article was first presented at a Forest Products Research Society Convention and is reprinted so that all of our readers can consider Mr. Cunningham's views.

The End

RAIMANN MACHINES

The Raimann model ASA automatic veneer patching machine is described in a new folder. The machine manufactures and inserts veneer patches at the rate of 27 per minute. It die-cuts the defect from the veneer, die-cuts a patch and inserts the patch. Die sets can be quickly interchanged; throat depth of 34" and weight of 3,300 lb. A larger size is also available.

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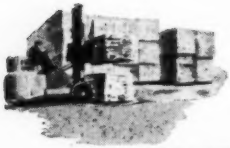

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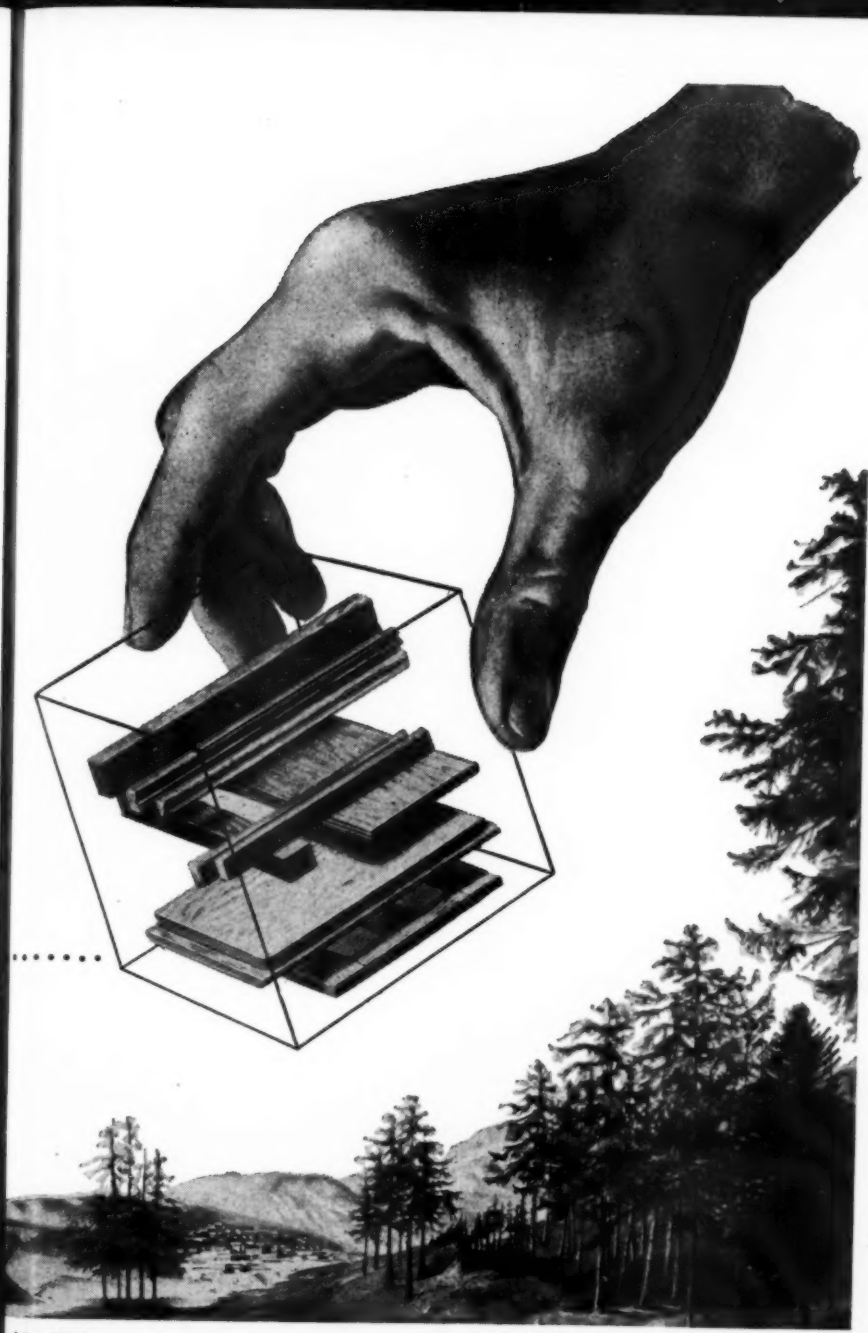

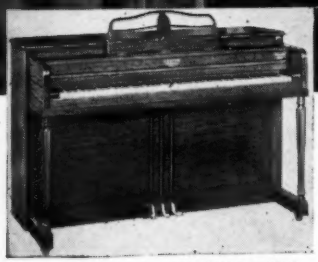

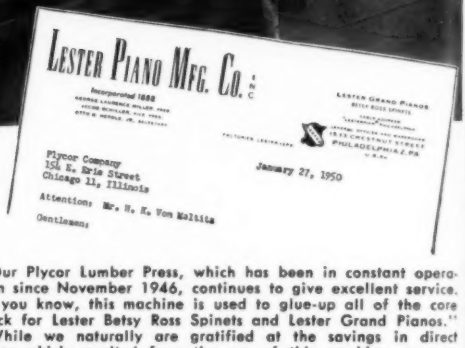

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"While we naturally are gratified at the savings in direct labor which resulted from the use of this machine, we are particularly pleased with the improved quality of our cores. Sunken joints and loss of cores due to joint failure during the planing operations have been completely eliminated."

"The inventory of cores between glue-up and planing has been greatly reduced, in fact we might say that it has been eliminated, as stock may be planed within a few hours after gluing instead of several days later as was the case when we were using clamp carriers."

"In conclusion, the use of this machine has lowered direct labor, improved quality and reduced the work in process inventory."

(Signed) *Lester Piano Mfg. Co., Inc.*

* * *

There's the evidence . . . the actual experience of a customer whose Plycor Lumber Press has been in constant operation for over three years. And Lester Piano Mfg. Co. is just one of 76 satisfied users of 82 Plycor Lumber Presses. Any one of them will tell you a similar story.

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Afloat *in plywood*

CRUISING down the river on a leisurely fishing trip, or roaring over the water's surface in an outboard marathon are extremes in boating that range from safe relaxation to daredevil excitement. But to the builder of boats, the difference is only one of design. The craft may vary in appearance and purpose, but in every case, dependability and good performance are required. From the king-sized cabin cruiser to the half-pint racing shell, a boat must be built to give the sort of service for which it was designed.

In many cases, particularly in the outboard field, that service is being obtained today with plywood—laminated wood, bonded with resin adhesives. The use of plywood as a boat-building material came, in large measure, as a wartime development. Some veneer boats were made before the war, but it was not a large volume operation. Then the war brought a need for large quantities of small boats for military use. Resin-bonded laminated wood was suggested as a means of supplying the need in a hurry and the idea proved practical. Fleets of plywood torpedo boats, reconnaissance cruisers and landing craft saw service under extreme conditions—from the Alaskan seas to the South Pacific — and the boats were found dependable and seaworthy.

The war years packed a lot of experience into a very short time. They proved that plywood boats, when properly built with the right materials, are durable and dependable. They also showed that these light, strong craft can be made with a minimum number of man-hours per boat. When the war ended, plywood outboards were sought for fishing, racing and pleasure cruises.

Two Types of Construction

Two different methods have been developed for the construction of plywood boats. In one, the plywood is built up over a mold and the veneers and adhesive are bonded together by means of clamping jigs or bag molding. In the other, the entire boat is made from sections of regular waterproof plywood panels. Little framework is needed in this type of construction and no molds or elaborate jigs are required. Moreover, the method lends itself more readily to model changes. The parts are cut by template and expensive jigs and tooling are not required in the assembly.

The Fleetcraft Line

The Fleetcraft Corporation of Philadelphia uses this method of construction. Standard-sized plywood panels, plus a few pieces of white oak for the skeleton frame, make up the lumber

Plexiglas is used in the side windows of the cabin cruisers. After the sheet is snapped into place, masking paper is smoothed back for protection in shipment.

requirements for the boats.

The Fleetcraft line includes fourteen-foot Runabout models, widely used for racing; utility boats of the same size that are ideal for fishing; and sixteen-foot cabin cruisers, fine for fishing parties or family use. The entire line of plywood boats is designed to be powered by outboard motors.

Fleetcraft boats are popular in all types of outboard competition, from grueling marathon matches that stretch out a hundred miles or more along a river, to closed course races on lakes or bays. The Company does not specialize in racing craft, but boat builders are always interested in these competitive events, just as motor car manufacturers watch the results of stock model automobile races. Outboard racing subjects a boat to the most rigorous sort of testing. The vibration of the wide-open motor and the pounding of the water as the hull slams into the waves brings to light weak spots of the boat in a hurry. The record of these sleek, plywood boats in outboard competition proves the remarkable ruggedness of the craft.

A Fleetcraft Runabout, for example, took first place in the Detroit Memorial Day outboard race in 1949. The boat was a veteran with more than two years of rough, high-speed use, but it crossed the finish line watertight and shipshape. Another Runabout, designed for use with a ten to twenty-two-horsepower motor, roared through a long period of racing and practice runs powered by a fifty-horsepower Evin-

Putting the finishing touches on three of the Fleetcraft plywood boats. A Cruisabout is in the background, while fourteen-foot Runabout models are seen in front.

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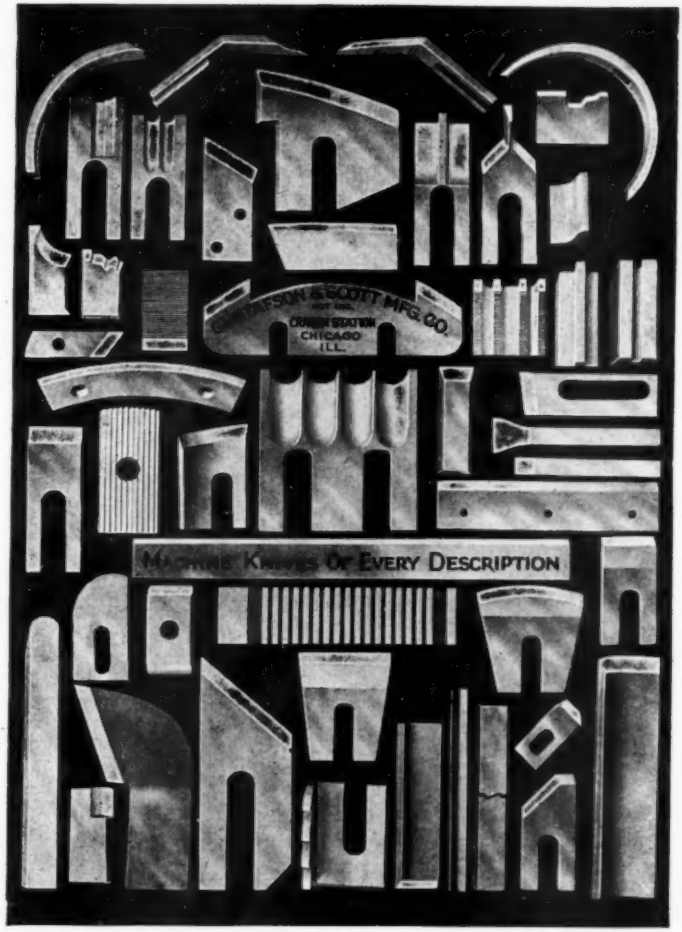

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Made from 3-ply old growth yellow Douglas fir, Art-Ply offers a new modern interior mode for wall and ceiling paneling. With edges rabbeted, it is self-joining. Neat, narrow mouldings, flush with the surface, are cemented into place with casein glue to break the sections into decorative panels and to cover joints between sections when installed. **You can't tell where the panels join!**

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Established 1890

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rude. On one occasion a careless pilot drove the craft out of the water and thirty feet up the beach under full throttle without damaging the hull. The manufacturer does not recommend the use of such excess power on its boats, and it frowns on cruising in the sand, but the incident does show the reserve strength of the resin-bonded boat.

As has been said, the Fleetcraft Corporation does not specialize in racing craft. The firm is just as interested in the sixteen-foot cabin cruisers as in the smaller, high-speed craft. The Cruisabout is not a slow boat, however, for with a big outboard on the transom, it will plane over the water at thirty miles an hour. But the Company thinks of these sixteen-footers as family boats. There is a roomy, comfortable cabin—fitted with dinette facilities in the deluxe models—and an afterdeck that is big enough to walk around on. The Cruisabout is probably the only stock outboard in the plywood field with so much room. It is designed for all-weather use. The front of the cabin is protected from rain or spray with safety glass windshields, and there are long, Plexiglas side windows, set in weathertight rubber molding. An awning may be installed over the afterdeck if desired.

Importance of Adhesives

Plywood boats are no stronger than the adhesives with which they are assembled. The bond which holds the plies of the veneer panels together and that used in assembling the various parts of the boat are cut from the plywood must be durable and completely waterproof. Resin adhesives, properly applied, give this sort of strength—and more. It has been repeatedly shown that modern, resin-adhesive bonds are stronger than the wood itself. Fleetcraft uses Amberlite PR-115 in the assembly wherever parts are joined. This resorcinol resin is particularly useful

for the application, for it cures quickly to maximum strength at room temperature with moderate pressure. It is entirely waterproof and is unaffected by gasoline or other solvents which may be used around the boat.

With the best in resin-bonded plywood for the raw material; skilled boat craftsmen to form and assemble the various parts; and waterproof, stronger-than-wood adhesives, such as Amberlite, made by Rohm & Haas, for the bonding agent, the plywood boat is assured of a long and useful life. It is light and tight, easy to transport and get into the water, and readily handled when it's afloat on the waves.

Reprinted from "The Rohm & Haas Reporter."

The End.

SMALL MOTOR SELECTION

A 4-page "Small Motor Selector" is available from the Westinghouse Electric Corporation. The first page of the booklet explains why there are different types of fractional horsepower motors, and the factors to be considered in selecting the right motor for the application.

The center pages, which open to form a large chart, present in tabular form the various types of small motors, together with complete data concerning horsepower range, speed characteristics, torque, reversibility, bearings, mountings, and application.

Typical speed-torque curves for various types of fractional horsepower motors are included, together with information on specialized standard designs for specific applications.

For a copy of this booklet (B-3075-C) write the Westinghouse Electric Corporation, Box 2099, Pittsburgh 30, Pa.

Wisdom is knowing what to do, skill is in knowing how to do it, and virtue is doing it.—**The Employment Counselor.**

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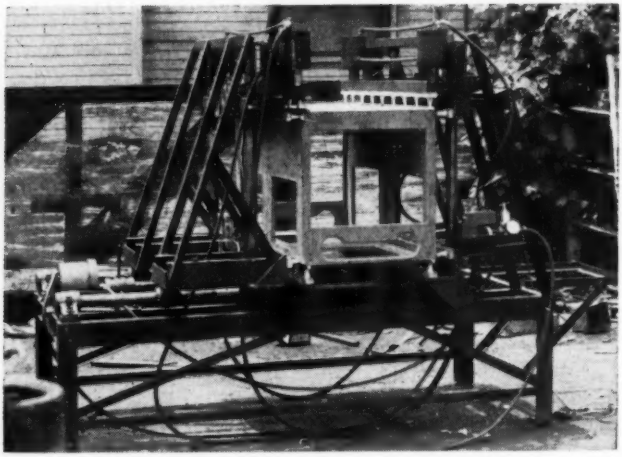

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The above picture denotes this type of press assembling two television cabinets in a single cycle operation.

This press was manufactured and recently installed in one of the large television manufacturing companies in Los Angeles, California.

Nation wide television cost reduction has been accomplished by the use of Woodwelding Production Tooling. Thirty-second glue line curing with Wood-Ray equipment, places the cabinet manufacture in a superior position to meet all competition with a quality product. Competition of today calls for your immediate action in contacting Woodwelding Incorporated Engineers.

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MODERN

production of golf club heads

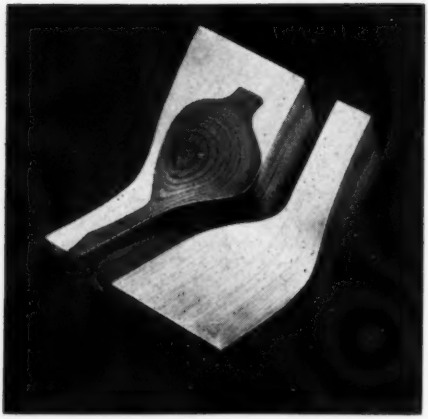
By G. R. Van Aartsen . . .

THE POPULARITY of golf as a recreation and sport for young and old alike in the postwar era has created a demand for superior golf clubs as well as better production methods to fulfill this demand.

The age old solid wood used in "woods" for years has done an outstanding job in supplying the industry with a satisfactory material for use in the production of "tee" clubs, familiar to all golfers. However, after the war, golf club manufacturers became interested in the development of an alternate material for use in the manufacture of "woods" which would be superior in practically all ways and at the same time permit them to develop more sources of supply resulting in more latitude in their purchasing and merchandising.

The "blue chip" that fulfilled all these requirements has proven to be the laminated wood golf club head. Not only was the manufacturers' status enhanced, but the golfer has benefited materially also.

Laminated "woods" are made from 40 to 60 odd layers of thin wood varying in thicknesses, formed and bonded together under heat and pressure with a synthetic resin adhesive which provides a bond of greater-than-wood strength. In addition to this, a more stabilized and moisture-resistant club head results by the interlaying of the individual layers of wood at alternate grain directions; this, of course, is reflected to the golfer in a more uniform swing-weight, regardless of moisture or humidity conditions. Laboratory and actual playing-condition tests have proved that the laminated wood golf club head is superior in physical strength, minimum moisture absorption characteristics, and hardness qualities. The manufacturer can be sure too, because of the use of selected layers of



Ingenious method of producing carved clubs from overlapping profiled laminated blocks is portrayed in the shadow photograph. Laminations have contour effect upon club.

wood, that no material defects will be present in the internal portions of the golf club head, that hosel (neck) strength is improved, that uniformity from head to head will be maintained and that no sorting or grading of heads will be necessary.

The club shown here, after being removed from the carving, is ready for the drilling and machining operations prior to installing the club shaft and finishing. Note the "bull's eye" which becomes an integrated reference to the golfer in addressing the ball.

The development of the laminated head was not an easy process to develop and many thousands of dollars were spent experimenting and developing machinery and processes to produce the laminated head. In addition to this the high percentage of scrap that developed in the early stages of its production was enough to discourage many prospective manufacturers and resulted in severe losses to all manufacturers who were determined to produce this head in volume. Then, too, there were many individuals and smaller firms who produced an inferior golf club head by utilizing soft type woods and unsatisfactory adhesives; this did much to undermine the "laminated" picture and, of course, was a factor in the golf club manufacturers' sales programs. Today, only the quality laminators remain and the embryo golfer may be sure that laminated clubs purchased from reputable manufacturers' sales outlets will provide many worry free hours of golf and enjoyment.

Laminated golf clubs finish beautifully and reflect a high degree of quality and character. Attractive club face insert is fabricated of fibre and maple laminations.

Present day golfers are enthusiastic

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about the merits of laminated "woods," and more professional golfers are turning to laminated "woods," to obtain the results that they are seeking. Anything that will give golfers a more uniform club to play with, will tend to make for a better golf game. It contributes to better control, tending to make good golfers better and new golfers more apt to see where their correctable faults lie, and allowing the player to stand or fall on his own golf game rather than on the action of the "woods."

For those of you who aspire, as does the writer, to near-par golf, the "woods" in your golf bag should not be considered lightly and for assurance of superiority and uniform swing-weight characteristics laminated woods are a must!

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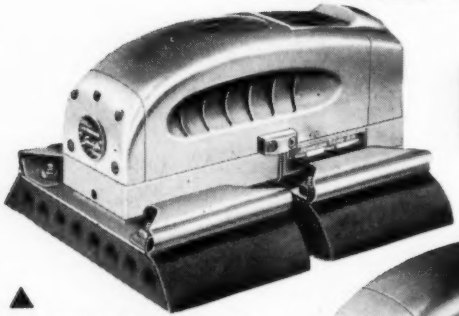

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Safety SECTION

SAFETY RECORD

The Chess & Wymond barrel plant, Louisville, Ky., recently logged its 500,000th man-hour free of lost-time accident since April 2, 1949. This is an all-time record for the plant and one of the best ever achieved in the cooperage industry, which normally has a high accident frequency. A dinner honoring the achievement was held.

HOSE SPREADS FIRE

At a New York wooden specialty plant, picnic forks and spoons are formed in gas-heated molds and blown to storage bins. When forming machines were shut down for the day, the last few spoons evidently overheated and ignited. An employee discovered fire in a bin and attacked it with a hose stream. As he did so flames burst out into the room, driving him away. Thirty-five sprinklers opened almost immediately and put out the fire, but more than a million forks and spoons were ruined by water.

Some wood dust was present, and apparently the hose stream dispersed a dust cloud which ignited. Use of water spray nozzles is preferable where flammable dusts are present.

Factory Mutual Record

Have a good vacation...but remember:
An accident can make you pay
An awful price for a little play!

GOGGLES IMPROVED

American Optical Company announce that goggles No. 305 and No. 306 will now be supplied with a rugged plastic face mask, proved through long extensive testing to be superior to the leather mask formerly used.

Leather face masks, according to the Company, possessed a major disadvantage in that they could not be sterilized. This was a handicap not only when the mask became dirty, but when it was to be worn by another worker.

The new vinyl plastic mask, now standard on the two goggles, can be sterilized by spraying, wiping or dipping (not boiling), and will retain its shape and properties. When wet, it will not shrink or curl. Perspiration will not make it hard; exposed to any moisture it remains flexible and soft.

American Optical Co., Southbridge, Massachusettes.

GUARDING
circular saws

by A. A. Soldner

IT IS necessary to so enclose and guard the circular saw that should the day-dreaming operator have his fingers in the path of the saw, the enclosure will have a tendency to prevent the hand from contacting the revolving disc.

This man failure which makes such guarding necessary may be illustrated by an injury which occurred on an overhead swing saw equipped with the conventional fixed guard over the top half and with an exhaust duct at the rear of the table. This exhaust duct became filled with sawdust and small trimmings. To correct the situation, the operator pulled the saw forward with one hand and reached over the table with the other to clean out the exhaust pipe, but he couldn't reach far enough. He knew that if he were closer to the exhaust duct he could more easily clean out the offal and waste. His brain was working, and his thoughts were concentrated on cleaning out the pipe. So he released the saw, letting it go back to its rest position. He then jumped up and sat upon the saw table. He gave no thought to where he was sitting, for the time being, but still thinking, he knew he couldn't clean out the pipe unless he pulled the saw forward. Consequently he pulled the saw out away from the exhaust pipe, at the same time cutting a severe gash in the thigh of his leg. Yes, men think, but of just one thing at a time. In the case just mentioned, it is very probable that if the saw had been properly guarded, the injury would not have occurred.

What is a proper guard for a circular saw? Such protection should consist of a hood covering and enclosing the section of the saw disc above the table at the top and sides and so arranged that it will adjust itself automatically to the thickness of the material being sawed, riding the material and dropping down to the table as the stock is withdrawn. The reason, of course, for the automatic feature is safety's common enemy number one—the human equation, that unpredictable man.

While a fixed or stationary guard does offer considerable protection, such guard is often set too high, unnecessarily exposing too much of the saw. Consequently the automatic hood type guard is the most satisfactory of all protective devices, although there is no one universal guard which is a cure-all for all operations. Its design and construction must necessarily depend upon the type saw to be guarded and the type of work done thereon.

The ordinary hand-feed circular rip saw is best guarded by the automatic

hood type guard attached to a splitter. This not only encloses the saw disc, but the addition of the splitter offers the further protection of preventing the stock from becoming caught by the teeth and hurled back against the operator. This splitter should be slightly thinner than the saw kerf and slightly thicker than the saw disc and should be placed close to the rear of the saw and in perfect alignment therewith. There are objections offered to the guarding of saws:

(1) There are old-timers who claim they must see the saw and many of these today offer the mute testimony of severed fingers because they insisted on seeing the saw. They are in the same class as those who see the train afar off—they saw the train yet they were hit on the crossing.

(2) Others claim they must cut to a line. This is not a serious objection, for it is an easy matter to extend a line in perfect alignment with the saw to a point in front of the guard. That line can be just as accurate a gauge as the saw itself. Then too, we must remember that band saws were invented primarily for cutting to lines.

(3) It is often asked, how can you rip a narrow strip and still use the guard? This is not a difficult situation to overcome, for a filler strip of thin material may be secured to the gauge, which thereupon becomes a straight edge permitting the free and unhampered use of the automatic features of the guard, or, a special low gauge or guide can be provided for use when narrow strips are to be ripped.

(4) Objections are frequently made because one saw guard and splitter cannot be used on all operations, or because it does not fit all thicknesses and all diameters of saws as encountered when making various setups. By that very admission the objectors admit that they cannot do all their work with only one saw. And, if one saw cannot be used to perform all woodworking operations, is it any more reasonable to expect one guard and one splitter to provide the protection for all operations? Their objection can be overcome in many instances by providing several throat pieces equipped with splitters and guards, especially designed for use with the various diameters and thicknesses of saws. When once provided, it is merely a matter of making the right selection for each setup and that should not be asking too much. The average saw changing operation requires such steps as these: shut off power, wait for the saw to stop, remove throat piece, grab wrench, put it on nut, loosen nut, remove saw, hang saw up, grab new saw, put saw on arbor, replace collar, replace nut, apply wrench to nut, tighten nut, take wrench off, put wrench away, put in new throat piece—some twenty operations which are done without a whimper or a murmur because it becomes necessary for the cutting of just one piece of dead wood, and yet, when it comes to the saving of live fingers objection is made to the one single act of putting into place the proper throat piece with a proper splitter and guard attached.

Automatic hood guards are also suitable and practicable for cross-cutting operations, although the type or method of attachment may vary, depending upon whether the saw is of the stationary, or of the horizontal, or of the overhead swing or under-swung type. Regardless of the type, there are practically no ripping or cross-cutting operations which cannot be guarded. Even notching, rabbeting, tenoning, grooving operations can usually be guarded quite effectively by enclosures clamped onto the table or guide in such manner that the pieces may be pushed over the

saw without bringing the fingers in close proximity to the saw disc itself. Since we are dealing with that uncertain human equation, we must not forget that the section of all circular saws under the frame or table also needs to be enclosed.

Now may we turn our attention to some circular saw accidents and make a few practical applications. First of all, management and supervision must know that safety engineering is more than merely preventing injuries—the cause for the accident which produces the injury must be eliminated.

This is well illustrated by a case in which a man was ripping four thicknesses of ¾ inch material, 12 inches long into 1½ inch wide strips, on a saw equipped with an automatic hood guard and a splitter which projected about 2½ inches above the table. In the course of the work one of the pieces became caught on the rear of the saw and was hurled against the operator's arm, breaking it. That was not the first time this occurred. It was a usual occurrence for these pieces to fly back. Consequently the operator was provided with a heavy leather apron, which would tend to prevent injury, but definitely did nothing to remove the cause of the accident. It was not until a piece flew back, breaking a man's arm, that steps were taken to remedy the situation by providing a proper spreader extending to a plane above the saw and placed close thereto. It would have been better to rip one or possibly two thicknesses instead of four. Who was responsible for the breaking of this man's arm? Certainly not the employee. He was put at the machine in the condition that it was; it was up to him to work on it. They did provide him with an apron, but they did nothing to eliminate the cause, only to mitigate the result. Management was at fault for not having

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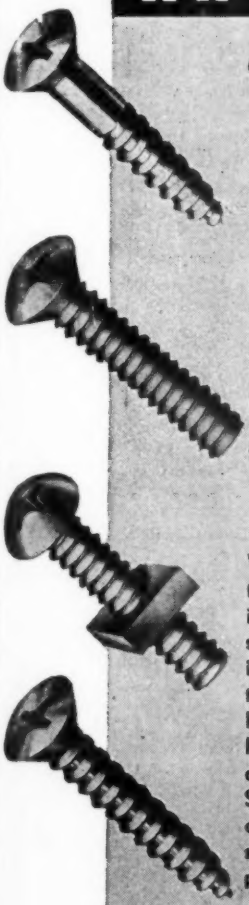

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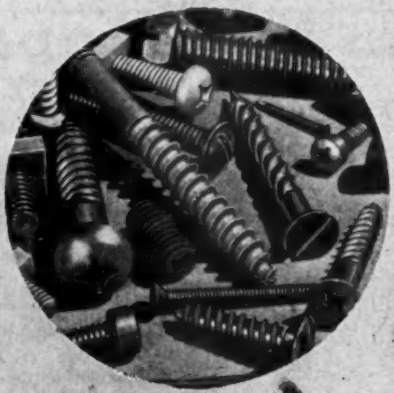

CONTINENTAL SCREW CO.

New Bedford, Mass., U.S.A.

provided the proper safe guard, and the foreman or supervisor who represented his management was not nearly as big as the responsibility he was to shoulder, for he was not versed in safety.

Some years ago I investigated three accident reports—all circular saw injuries—all occurring in the same plant. All three injuries occurred on the same saw and within the same hour. A 14 inch circular rip saw, equipped with an approved automatic hood guard and splitter, was set up to rip pieces 5 inches wide out of material ⅜ inches in thickness and 10 inches long. The operator had worked on the machine just a few minutes when one of the pieces flew back and struck him in the groin, resulting in injury No. 1. The night foreman then sent a second employee to complete the operation, but first protected him with a heavy leather apron. The man then proceeded to rip, but soon a piece came back smashing his fingers, disabling him and resulting in injury No. 2. The foreman thinking that the guard was at fault then removed both guard and splitter and put operator No. 3 on the job, who worked just a few minutes when one of the pieces was about to be hurled back at him. Seeing the situation he threw out his hand to hold down the piece and in so doing contacted the exposed saw, resulting in amputations of his fingers and injury No. 3. It was only after this third injury that the foreman really eliminated the cause, which was that the rear of the guide was set too close to the rear of the saw.

Supervisors must be specific, saying what is meant and meaning what is said. This is well illustrated in a case in which a power-feed rip saw was being used as a hand-feed machine. One day an apprentice was ripping some stock about 24 inches long on this saw and

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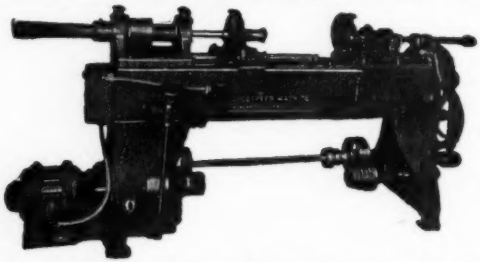

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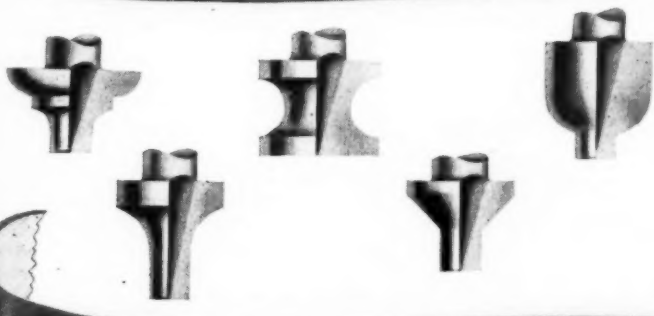

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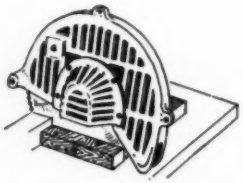
was stopped by the superintendent with words such as these: "Don't rip such short material on this saw. Be careful, safety first," and passed on leaving the young man dazed. "Be careful"—"safety first"—"don't get hurt"!—"Too short"—"24 inches—too short!" What did it all mean to him? He looked around and found some material 28 inches long. If 24 inches is too short this should be long enough, he thought; so he began to rip the material. He pushed the piece into the saw, so that it projected beyond the saw about 8 inches and then he reached ahead of the raised out-feed roll to pull it through. In the attempt, the piece was caught by the saw, throwing his hand into it, causing the loss of the major portion of the hand.

Would it not have been as easy to stop for a moment, have a friendly chat with this lad and explain why it was that the 24 inch piece was too short? Couldn't he have explained the danger of the saw especially the peril of working between the feed rolls and the revolving saw disc? Couldn't he have informed him that it would be dangerous to rip any material unless it projected beyond both front and rear feed rolls? But further, is that the way to use a self-feed rip saw?

One manager failed not only to preach safety, but also to practice it. An inspection was made of a particular lumber yard and retail shop. A rip saw was found unguarded, the guard apparently having been off the machine for some time. Orders were issued to replace the guard. Several re-inspections were made, and each time it was the same old story—the guard had just been taken off and it would be replaced. About three months after the last re-inspection the manager was ripping a piece of material 5½ inches wide out of a piece 7 inches wide, ¾ inches thick and 31 inches long, without the guard or the splitter being in place. He had ripped the piece completely through and was bringing it back with his right hand, lifting it up at the rear end and pulling it towards him, when the piece contacted the saw teeth on the underside of the board. He held onto the piece to prevent it flying into space, but it swung around to the left and upward rupturing his trachea, causing death a few hours later.

This man knew better, for he had lost a finger on an unguarded saw some years before, and he had been

AUTOMATIC GUARD for SWING and RADIAL CUT OFF SAWS



Meets all specifications of the American Standards Association.

The SURTY MFG. CO., INC.
4139 KINZIE ST.
CHICAGO 24, ILL.
Send for Pages 7-8

TANNEWITZ AUTOMATIC GUAGE
for Swing Saws
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GRAND RAPIDS MICHIGAN

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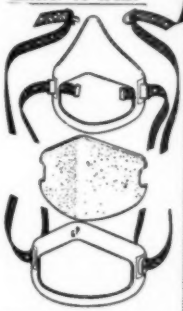
Easier to wear



Easier to Clean and Keep Clean

Trial Sample $1.50 Postpaid

STOPS DUST IRRITATION!

Easier to breathe through and talk through than an ordinary pocket handkerchief — yet filters non-toxic nuisance dusts as small as 1/25000 of an inch.

Extremely light weight—only 1 oz. complete.

Self-adjusting to every face size.

Attractively styled to suit the most discriminating wearer.

Simple in design: only four parts—four tough, long-wearing, interlocking parts.

Only respirator made with long-lasting washable filter—can be used over and over again.

Here's dust protection your workers will welcome and WEAR!

Write TODAY for Descriptive Circular...

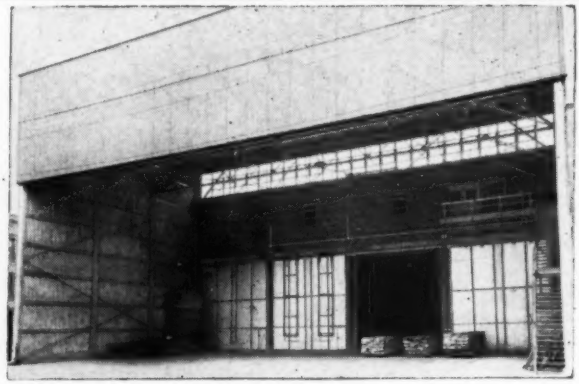
THE GOGGLE PARTS COMPANY
1468-70 W. 9th Street • Cleveland 13, Ohio

told repeatedly to use a guard and had promised to do so, but because he was a manager he felt immune; an accident just couldn't happen to him. Certainly that type of a manager or a supervisor does not set a very good example for his men.

In conclusion, no safety program can work successfully unless: (1) top management is completely sold on safety, (2) unless supervision is fully safety conscious, and (3) unless employees are so safety minded as to realize that to enjoy life tomorrow they must live and work safely today.

This speech was presented at the 1949 National Safety Congress.

The End.



PACKAGE HANDLING

ElectroniK Control

Drying Capacity . . . Ten Cars of Lumber

* "These are the most modern kilns available and are especially designed for the production of high quality dry lumber of all kinds. They can produce dry lumber at the rate of several carloads per day. Lumber is placed CROSSWISE in the kilns by means of fork trucks. Each package of lumber contains 2,000 board feet, and they are stacked four packages to a height of over 20' - 0". These are "external" kilns, which means that all heating and operating equipment is located outside the kiln proper. In this case the equipment room, containing the heating units and fans, is located above the kilns at the top of the stairway at the right. Temperature, humidity, and ventilation are controlled exactly by the ElectroniK POTENTIOMETER MULTIPLE THERMOCOUPLE METHOD."

* The Imrie Dry Kiln Co. appreciates this report from the largest manufacturer in its field.

IMRIE DRY KILN COMPANY

PEARL & OTTAWA ST. GRAND RAPIDS, 2, MICH.

WALNUT MANUAL

"Walnut Yields," a report on walnut dimension, written by C. H. White, assistant manager of the American Walnut Manufacturers Association, is just off the press. The report is based on figures gained in varied dimension experience and a recent study of walnut dimension in large dimension manufacturing plants.

The study was made and published to point out the most economical grade of lumber to purchase for particular needs. Based on hundreds of thousands of figures, it involves the yield of dimension items that can be obtained from the various standard grades of lumber. By using these expected yields, net costs of raw material can be quickly estimated.

American Walnut Manufacturers Association, 666 N. Lake Shore Drive, Chicago, Ill.

New Literature Section...

SCIENCE OF MODERN WOOD FINISHING, by G. L. Deniston, Published by Research Press, Inc., 137 N. Perry St., Dayton 2, Ohio. 350 pp. $6.00

The book is an excellent handbook for any wood products manufacturer who carries on his own finishing operations. Covering 200 subjects, the book gives up-to-date information on wood finishing and is well organized. A section of halftones shows production line finishing of wood products. There are tables and charts which will be interesting and informative to every finisher. The glossary covers all terms used in industrial wood finishing.

DEWALT POWER FEED

The DeWalt safety power feed for all radial arm and under table saws is featured in a folder issued by the Company. In addition to description and specifications, six power feed combinations are illustrated. These include straight line rip saw, bevel rip, moulder, shaper, rabbeting and ploughing.

DeWalt Inc., Lancaster, Pa.

"HELPFUL HINTS"

"Helpful Hints," issued by the Macklin Co., is a 63-page booklet of useful information for all those interested in the progress and use of grinding wheels. Pertinent facts are given for everyone from the purchasing agent to the operator. Particular attention has been given to safety. A complete list of wheel recommendations is listed.

Macklin Co., Jackson, Mich.

GLUE EQUIPMENT

A new and complete catalog of laminating and gluing equipment has just been completed by Black Brothers. It includes all the latest developments in Black's complete line of spreaders, mixers, presses, heaters, clamps and other gluing equipment. One of the outstanding features is the pictorial section which shows installations in factories. Other details and specifications may suggest cost saving ideas which can be applied.

Black Brothers, 990 9th St., Mendota, Ill., include company name, address and your title.

IRWIN CATALOG

Irwin wood-boring tools are described in catalog No. 50. It includes information on various kinds of bits, screw drivers, etc. Complete specifications are given and the catalog is profusely illustrated.

Irwin Auger Bit Co., Wilmington, Del.

DIRECTORY READY

The new "Best's Safety Directory for 1950-51," covering the entire field of safety, hygiene, first-aid and sanitation is now available. The unique directory combines the best practical features of a safety manual, directory, index, encyclopedia and catalog into one comprehensive, profusely illustrated, 511-page volume. It shows what

INSTALL A

YOUNG & BERTKE

DUST CONTROL SYSTEM

Uncontrolled dust in your plant may mean the difference between substantial profits and losses. Your production is always higher when working conditions are better. If your present dust collecting system is obsolete, if you are considering additions, or if you need a completely new dust control system, consult us. Young & Bertke engineers are specialists in the design and installation of efficient, low cost, dust control systems. We will be glad to talk to you. There is no obligation.

The YOUNG & BERTKE Co.

1122 Buck Avenue Cincinnati 14, Ohio

safety products or devices to use for specific hazards; how to use them; where to get them.

Alfred M. Best Co., 75 Fulton St., New York City.

BALLANTINE PLANER

Ballantine 24" Thickness Planer is fully illustrated in the Ballantine Industries' folder. General specifications, electro-thickness indicator and pressurized dust-tight compartments are featured. The surfacer does rough or cabinet planing, the folder states.

Ballantine Industries, Absecon, N. J.

F.P.R.S. PROCEEDINGS

The third volume of the Proceedings of the Forest Products Research Society is announced. This 607 page,

MORE SPEED MORE SUPPORT

CUT COST OF SAW-BLADE REPLACEMENTS

MORE WORK

Paddock Ball-Bearing Band Saw Guides will more than pay for themselves in a very short time by (1) Saving on Blade Breakage, (2) Speeding up production, (3) Cutting any materials at any speed, and (4) Protecting workmen. The whole secret of Paddock Efficiency: Interchangeable ball-bearing wheels running with the blade give strong yet friction-free support. They make any band-saw, old or new, work better!

Write for circular and prices.

PADDOCK TOOL COMPANY

Guide Makers Since 1920

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BALL-BEARING
BAND SAW GUIDES

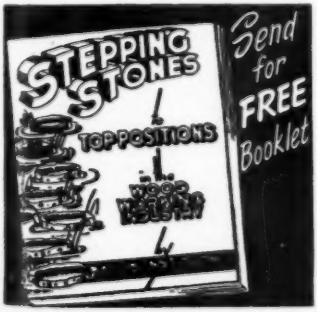
I Can Help You To
BE A WOOD PRODUCTION ENGINEER

Learn At Home In Your Spare Time

I've helped a host of ambitious men to attain top positions in the furniture and woodworking industry. I'll help you if you'll just give me the chance. My 81-Lesson Home Study Course or my Resident Course at Grand Rapids is highly personal and teaches you the arts of Sketching — Drafting — Rod Making — Time Study — Cost and Production Scheduling. Free G.I. instruction. Money back trial offer to non-veterans. Get the complete facts — then judge!

With THE FAMOUS KLOK TRAINING COURSE

JOHN H. KLOK, Pres.



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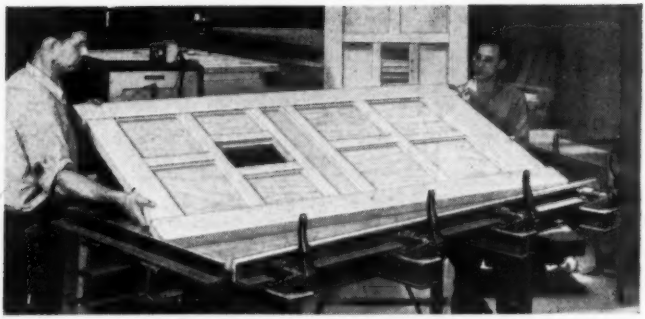


20 TIMES MORE PRODUCTION with DE-STA-CO TOGGLE CLAMPS!

De-Sta-Co Toggle Clamps speed production for this door manufacturer. Six Model 640 clamps are used in the fixture to obtain quick clamping action and positive holding pressure, evenly distributed. The use of a dielectric bonding device and new-type fast-drying glues speed the drying cycle to such an extent that the fast action of De-Sta-Co Toggle Clamps is required to maintain a high rate of production. Result: 20 high quality exterior doors in five hours; ordinarily, 1 door would be processed in this time.

You can select from 40 models of De-Sta-Co Toggle Clamps for progressive, modern tooling to meet today's competition. Their well-engineered design and rugged construction give you *quick* clamping and *positive* holding pressure. Whatever your work holding problem, there's a De-Sta-Co Toggle Clamp to solve it.

See the complete line of De-Sta-Co Toggle Clamps in our illustrated catalog, No. 49. Write today for *your* copy and the name of the stocking representative in your area.

DETROIT STAMPING COMPANY
312 Midland Ave. • Detroit 3, Michigan

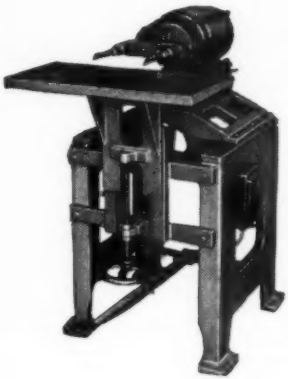
clothbound book contains the 53 technical papers and discussions presented at the Third National Meeting of the society, May 1949, in Grand Rapids. It is a valuable reference work covering the entire industrial wood utilization field.

Order from Forest Products Research Society, Box 2010, University Station, Madison 5, Wis.

CONGRESS LUBRALIFE BEARINGS

The new Congress Lubralife pillow blocks bearings are illustrated in Sheet CD-309. They are described as self-aligning and permanently lubricated. Dimensions and list price of Type "A" and "B" pillow blocks and flange type bearings are given.

Congress Drives Div., Tann Corp., 3750 E. Outer Dr., Detroit 34, Mich.



Simple . . . . . But So

EFFECTIVE

INDIANA TYPE 15H
TWO SPINDLE BORER
Foot or power feed

Also 15M:2 air-operated
Boring capacity: 1" to 25".

INDIANA FOUNDRY, MACHINE & SUPPLY CO.
Designers, Builders of Special Equipment
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Marathon

LOG AND BAND RESAWS . . .
Marathon High Speed Steel Knives are made in any length, width, or thickness. They have the proper degree of hardness to insure a sharp clean cutting edge that will not chip or turn over.

CUTTING SPECIALTIES . . . .
Marathon High Speed Steel Wing-cutters are precision ground and balanced. Wing-cutters can be made with either 2, 3, 4, or 6 wings, any size, diameter, width or form desired.

Territories available to qualified distributors.

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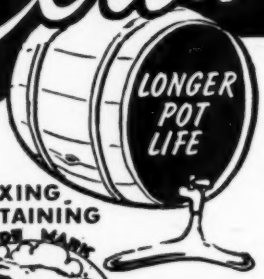
14307 Schaefer Hwy. • Detroit 27, Mich.

"Certus" LIQUID ADHESIVE
...always ready to use!



NO MIXING
NON STAINING

... ready to go to work when the whistle blows! No heating. No waiting. It's ready for work when you pour.
"Certus" sets almost instantly when pressure is applied. Its high bonding strength and colorless glue line all but make it part of the wood.
When quick setting, non-staining and high bond strength are factors, "Certus" low initial cost is equalled by its quick, easy handling for high production output.
"Certus" needs no catalyst. Its tough binding strength adds to product quality . . . costs no more. Send for a test sample.
"Certus" is another outstanding MONITE industrial adhesive for industry. Behind it stands 35 years research and development.

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WATERPROOF GLUE

MONITE WATERPROOF GLUE COMPANY
1628 NORTH 2ND, MINNEAPOLIS 11, MINNESOTA

REPORT FROM PORTLAND

As we gather together the last pages of this issue, early reports are coming in from the F.P.R.S. show in Portland. Of course, WOOD WORKING DIGEST will give a detailed account in the August issue.

A trip to the great Northwest, where logging is more than a livelihood and where legendary tales of adventure and courage surround the lumberjack, is a stimulating experience. Perhaps seeing Nature helping along with the raw material gives us a complete picture of our own place in the woodworking industry, an appreciation for the forest conservation programs and an increased measure of respect for the wood products we manufacture. While there were some objections to holding the show in Portland, we are glad for the scenic beauty enjoyed and the forestry knowledge gained on this trip West.

A few words about the Show and Convention: it is still too early for final attendance and results of the Show. Convention-wise, the program committee did a splendid job of balancing technical sessions so that all phases of our industry were considered. Exhibitors are certainly to be complimented on appearance of their booths, and the man-power which kept on smiling and giving answers with persistent consideration and goodwill. We believe that these shows will pay big, although possibly not immediate, dividends to the entire woodworking industry.

EXPORT GUIDE

Designed especially for the small businessman, the booklet, "Guide for the Prospective Exporter" explains in 51 pages the 10 steps in planning an export business. Export problems are explained and pitfalls exposed.

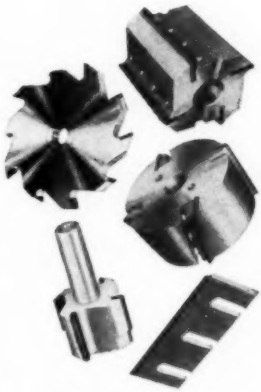
Economic Cooperation Administration, 800 Connecticut Ave., N. W., Washington 25, D. C.

"... OVER 800 HOURS OF EXCELLENT SERVICE"

"... ABOUT 30 TIMES THE NUMBER OF PIECES BETWEEN SHARPENINGS ..."

ENTHUSIASM....

Customer enthusiasm is natural for Meyco Carbide Tipped Sticker Knives, Cope Heads, Shapers, Moulders and Router Bits. Such carbide tipped cutters generate less heat than steel tools, are fed into the work easier and faster; they last an unbelievably longer time and produce smoother finishes often eliminating a sanding or polishing operation.



Made to YOUR specifications! Inquiries welcome on the application and cost of Meyco carbide tipped cutters.

W. F. MEYERS CO., INC., BEDFORD, INDIANA

REICHHOLD CHEMICALS NEW DIVISION

Henry H. Reichhold, founder, owner and chairman of the board of directors of the Reichhold Chemical Company, announces the acquisition of Nobell Resins Company, Asusa, Calif. The latter firm will be operated as R.C.I.'s Pacific southern division under the general supervision of M. W. Reece, vice president in charge of West Coast operations.

TOOL ENAMEL

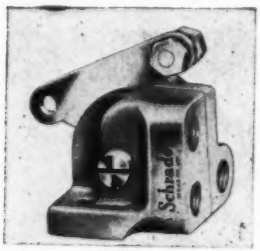
A new coating was developed for machine tool finishes by the Maas & Waldstein Co., Boston, Chicago, Los Angeles, and Newark, manufacturers of industrial finishes.

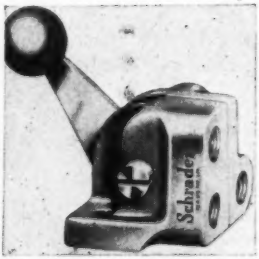
This new finish known as Dulac dull black lacquer enamel L-43 is made especially for wrenches and other cast iron, steel or aluminum machine tools.

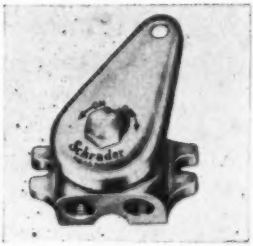
Dulac produces an extremely tough coating that hides surface flaws.

Equipment and Supplies for the WOOD WORKING INDUSTRY

BANTAM SIZE VALVES







A. Schrader's Son has released a complete line of small compact operating valves designed for durability and simplicity of construction, featuring the sliding disc principle and made of forged brass. One steel bolt holds the two piece body and internal parts in place and contributes to time saving, low cost maintenance. Available for hand, foot, knee or mechanical actuation, they are especially adaptable to cylinders up to 3½ bore in short strokes. Actual dimensions of body are 1⅝ by 1-11/16.

A. Schrader's Son, 502 Vanderbilt Ave., Brooklyn 17, N. Y.

• • • • •

SPRAY BOOTH COATING

A removable plastic coating designed to simplify spray booth maintenance is announced by Specialty Coatings Laboratory.

The coating is applied to the interior surfaces of the booth by either spraying or brushing, one gallon usually being sufficient to coat the interior of one average industrial spray booth. The booth can be put into operation immediately after it is coated, we are told. Whenever an undesirable paint accumulation builds up on the interior surfaces of the booth, the plastic coating can be peeled off in sheets, removing with it all paint overspray and leaving a clean dry booth.

The booth coating is completely

waterproof and has found application to the water panel of waterwash booths, the manufacturer states. The coating is also highly resistant to the regular solvents used in paints and lacquers. It is furnished in white to aid the operator's visibility.

Specialty Coatings Laboratory, Dept. WD, 1721 N. Water St., Milwaukee. Wis.

BED POST PINNING MACHINE

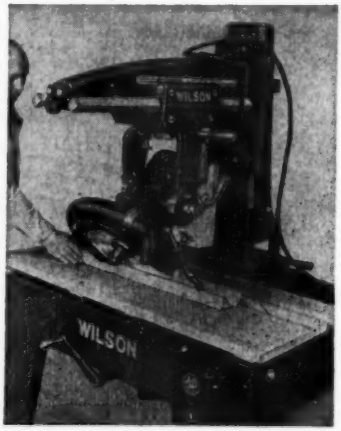
The Redin Production Machine Company recently announced a new machine for power driving two bed lock pins into bed posts. This machine was engineered and designed to eliminate the tedious and labor consuming task of driving pins by hand.

Sturdily built, it is air powered and has an automatic self-feeding pin hopper. The driving cycle is foot controlled leaving the operators hands free to handle the stock.

Simple adjustments are provided for posts up to five inches square and for

holes drilled 0 to 1 inch from the face. Adjustable stops are readily set making it very easy to change from rights to lefts. An inspection light tells the operator at a glance whether or not two pins are in position to be driven into the post.

For further information and com-



BEVEL RIPPING . . .
ONE OF OVER 1000
WILSON OPERATIONS

A WILSON IS YOUR BEST INVESTMENT

WILSON
RADIAL CUTTING MACHINE

MAKE YOUR "PILE OF STOCK"
Pay EXTRA Dividends with a
STURDY, SPEEDY, ACCURATE
WILSON

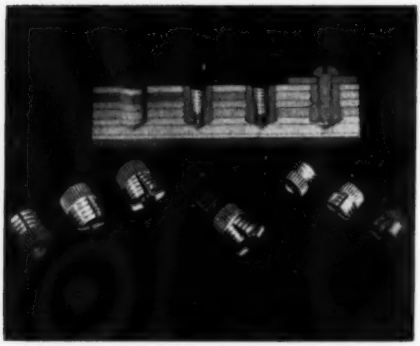
For further information write to

MEDIA MACHINE WORKS, INC.
MEDIA, PENNSYLVANIA, U.S.A.
Est. 1922

plete details write to Redin Production Machine Company, Dept. WD, 215 Robert Avenue, Rockford, Ill.

ANCHOR NUT INSERTS AND RIVETS

The South Chester Corp. is offering fastening devices of special interest to many woodworkers. The Southco blind rivet consists of a slotted tubular rivet with an inserted grooved pin. When the pin is struck flush with the head of the rivet, the lower part of the rivet expands and the prongs spread insuring a dependable tight rigid joint. The rivets can be used in a number of applications where wood and metal are to be fastened.



This firm's anchor nuts are designed to permit the use of machine screws for attaching plywood and wood to other objects. These one-piece threaded steel inserts are locked against torque and pull-out by expanded barbs and serrations. Installation is made by drilling a hole in the wood; driving the anchor nut with a hammer and expanding with a machine screw or punch.

Suggested applications include panels on telephone switchboards, mounting hardware and as a unique method of assembling knock-down booths, cabinets, tables, etc. Material can be ⅜" thick or greater and the screws can be removed and replaced repeatedly with-

5 BASIC UNITS IN 1 PLURALITY

OILSTONE GRINDERS

With one Mummert-Dixon Plurality Oilstone Grinder you get (1) Coarse Oilstone Wheel, (2) Fine Oilstone Wheel, (3) Grinding Cone, (4) Leather Stropping Wheel and (5) General Grinding Wheel. Made in 3 sizes to meet every grinding and sharpening requirement in woodworking plants. Designed for hard and long usage. Efficient. Easily accessible. Investigate Mummert-Dixon equipment now. Send for informative literature today. No obligation.

MUMMERT-DIXON CO.

124 Philadelphia St., Hanover, Pennsylvania

out damage to wood or anchor nut thread, we are told.

South Chester Corp., Dept. WD, Finance Bldg., Philadelphia 2, Pa.

WOODWORKING VISE

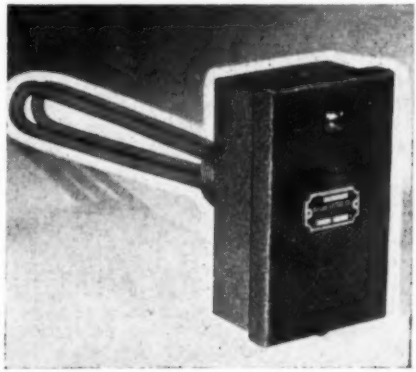
A new woodworking vise designed for unusual versatility is now in production at The Will-Burt Company. Made of cast semi-steel and weighing 16 lbs., the vise has machined holding surfaces 2½" wide by 3½" deep—sufficient flat surface to hold an object firmly without marring it, the manufacturer claims.

Most unusual feature of the new product is its ability to be placed on its steel post-type base for use in right or left hand horizontal, as well as the vertical, position, and to be turned to the most convenient direction for the job to be done. The vise locks in position on its base automatically when its jaws are tightened upon the object to be held, avoiding the necessity for a separate adjustment often used on other vises which turn in a horizontal plane.

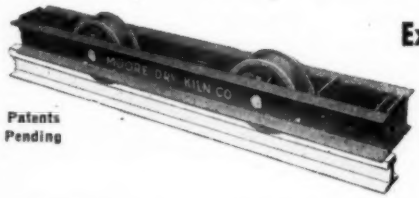
Will-Burt Co., Orrville, Ohio.

VULCAN WATER HEATER

The Vulcan automatic water immersion heater can be easily and inexpensively used in large or small tanks,



The New Moore ROLLWELD Dry Kiln Truck



Patents Pending

Extra-Value Features Include:

★ All-welded frame. New "hat" spreader makes frame 500% more rigid.

★ Precision-fitted, ground roller bearings make starting easier under heavy loads.

★ Pressure Lubrication — groove-seated washers retain lubricant.

★ Stronger axles — easy to replace.

Specify Moore "Rollweld" on your next kiln truck order. *Write today for information.*

MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

JACKSONVILLE FLORIDA · BRAMPTON, ONT. CANADA · VANCOUVER, B. C. CANADA · NORTH PORTLAND OREGON

ranges, boilers, etc., where there is a requirement for hot water, and where electricity is readily available. It is also a dependable auxiliary heater and can be used as a booster with existing facilities.

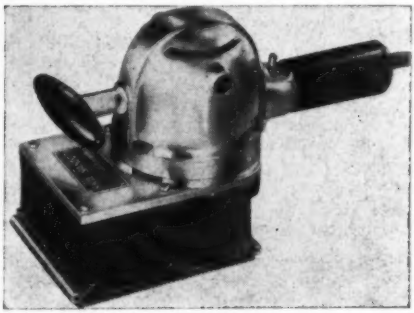
This type of heater, especially good for small business and manufacturing establishments where low-cost hot water is needed, can be installed by screwing it into the tank or boiler through the 1" or 1¼" pipe threaded flange or spud, and connect to the nearest source of alternating current.

To insure against the heater burning out in the case of a low water condition in the boiler or tank, the element is bent back and permanently attached to the screw bushing of the heater making direct contact through the bushing with the thermostat bulb.

Send details of your proposed installation or use of this type heater to Vulcan Electric Co., Dept. WD, Danvers, Mass.

IMPROVED SANDER

An easy-to-use metal clamp for rapid paper attachment heads the list of improvements on the new, re-designed model 438 Skil oscillating sander. The clamp fits into grooves at both ends of sanding head, securely holding paper over vibrating head. Older models may be easily adapted to use this new clamp. Sandpaper may also be applied with cement.



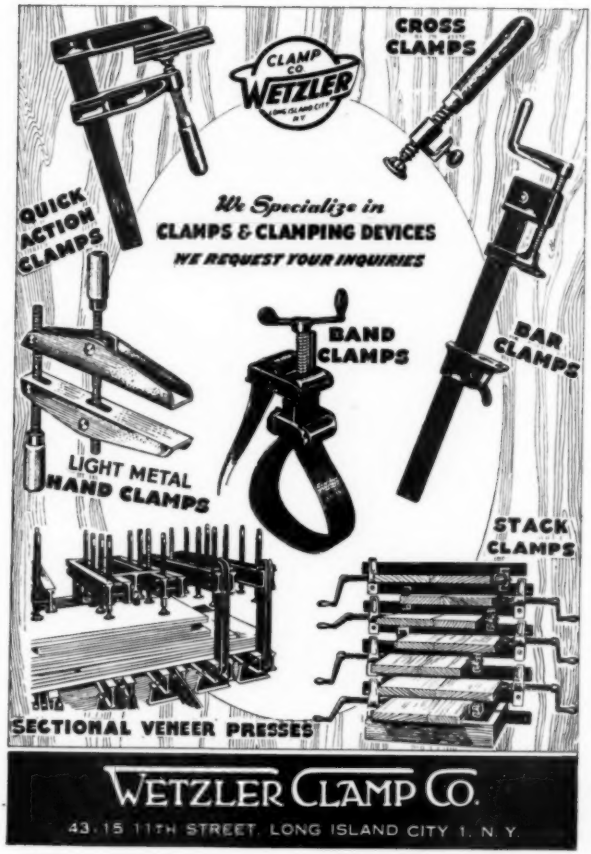
Additional improvements include a scientific dampener that practically eliminates all vibration, a re-designed rear handle with thumb operated switch and an improved motor housing for efficient cooling. Gearless drive and a molded synthetic rubber head that won't mar or gouge work, allows user to work right up to moldings, recesses and corners. Sander is good for furniture, cabinet and other types of wood finishing.

Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill.

FAST FLEXIBLE GLUE

Federal Adhesives Corp. announces the introduction of a new all purpose glue, F2214. This versatile adhesive glues most any surface, the company states. It is a fast setting resin adhesive that dries cold, tacks immediately, dries fast and is permanently flexible. It is said to work equally well in both hand and automatic gluing and labeling machines.

Federal Adhesives Corp., 210 Wythe Ave., Brooklyn 11, N. Y.



VIBRA-FREE SAWS

"Vibra-Free" saws are available in diameters from 8" to 16", inclusive, and with the customary number of teeth for these sizes of saws, or with special numbers of teeth at the customer's request.

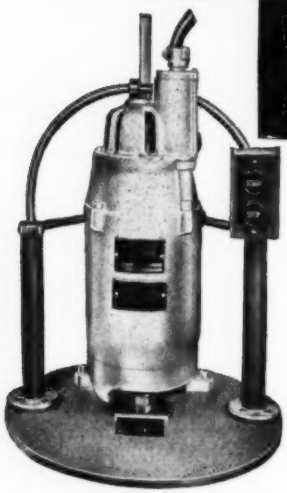
These saws are particularly well suited for the cutting of dense materials, such as plastics of various types, and treated woods. We are told they are also good for finishing or sizing operations on such machines as double end tenoners.

"Vibra-Free" saws are very smooth cutting because of the fact that the W. F. Meyers Company has worked to eliminate the vibration which is inherent in every saw blade, due to the strains set up during heat treating and tensioning. For this same reason, longer life can be expected from the carbide teeth between grinds, the manufacturer claims.

IT'S NEW!

IT'S PORTABLE!

IT'S FOR HEAVY DUTY ROUTING



Here at last is a portable router for **heavy duty** work. The new Onsrud W-215 high cycle electric Portable Router is a 5 HP unit with a 15,000 RPM spindle speed. It works fast and cuts clean. It is built for routing four quarter and six quarter plywood and other heavy materials including aluminum. The W-215 is a quality built router . . . light weight in construction.

WRITE FOR Bulletin 1131 for complete information and specifications. See how the W-215 can be adapted for a "self-made", low cost table shaper or router.

TYPICAL USES include routing of sink tops, window openings and dinette tops. One inch hardwood plywood stock with plastic face and Masonite backing has been routed at speed of 26 feet per minute.

Onsrud

ONSRUD MACHINE WORKS CORP.
3947 PALMER STREET
CHICAGO 47, ILLINOIS

Sales Offices in All Principal Cities

By means of the "Vibra-Free" design, it is possible for the saw smith to distribute more evenly the stresses set up in the saw during hardening, thus achieving a more nearly perfectly tensioned blade. The inserts, in turn, help absorb vibrations set up during the operation of the saw.

For additional information, write to Dept. WD, W. F. Meyers Co., Bedford, Ind.

BETTER SUPERVISION

A booklet that should be owned by every supervisor is the 40-page "Supervisor's Memory Jogger," published monthly by the National Foremen's Institute, Inc. Topics discussed are pertinent to good management. Space for memorandums is given as well as practical ideas for better supervision.

Order from the Institute, 100 Garfield Ave., New London, Conn.

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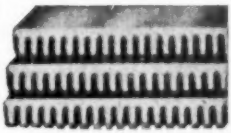
KNOUREK (PATENT) BALL BEARING SHAPER COLLARS

Knourek Patent Ball Bearing Shaper Collars for use with plain beveled edge shaper steel or Lock Edge Shaper Steel. Ask for circular covering Knourek Ball Bearing Shaper Collars and Schmidt Lock Edge Collars. This combination prevents accidents on shaper and knives cannot become loose and fly out of collars.



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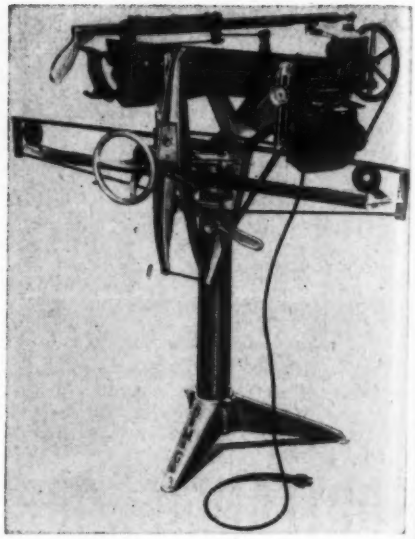
ROCKFORD, ILLINOIS
Phone: 4-9441 or Wire: RK 88

SAW FILER

A new motor driven hand saw filer has been announced by the Beaver Manufacturing Company of Inglewood, California. This new machine has been develcped to speed the operation of saw filing in saw repair shops. The new BeMaCo Rapid Hand Saw Filer files all hand saws from 4 point to 16 point, as well as keyhole saws. A calibrated dial sets the exact angle of the file necessary to get the proper tooth pitch or "hook." Speed of machine is adjustable to operator's working speed. The feather-touch filing mechanism gives the operator absolute control at all times, the manufacturer claims. A tooth can be touched lightly or as many times as necessary to get the desired results. A special clamp firmly grips the saw at the point of filing to eliminate chatter and produce a sharp cutting tooth.

The BeMaCo Rapid Saw Filer files fully crowned or straight saws without

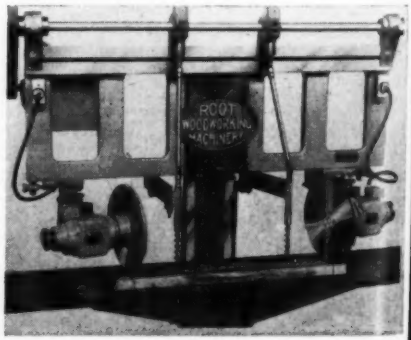


special carriers or attachments. Saws can be filed entirely from one side or from both sides, it is said. Saw handles need not be removed when filing.

Complete details can be had by writing Beaver Manufacturing Company, Dept. WD, Inglewood, Calif.

ROOT SAWING UNITS

These demountable units increase the value of any gang borer considerably. With these units a standard gang borer



can be used for double end trimming and boring with each table feed stroke, we are told. These units will fit most makes of gang borers.

By disengagement of the boring spindles, the standard borer serves as a double or single end cut-off saw.

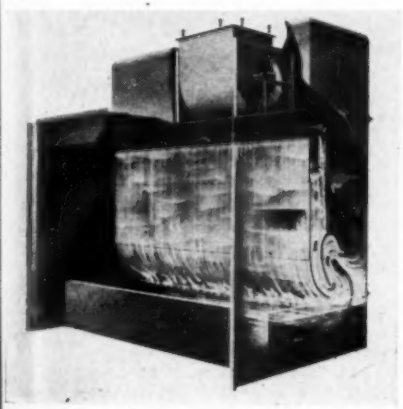
Miter cuts can be made as the saws are adjustable either to the right or left of their straight line position. They are also equipped with a vertical adjustment and can be adjusted towards or away from the operator.

Motors provided are 1 or 2 H.P., 3600 R.P.M. with saw arbors at each end. The units are described in detail in Bulletin No. 177 issued by the B. M. Root Company, York, Pa., and a copy will be sent upon request to Dept. WD.

SPRAY BOOTH

A new booth, called the Roto-Wash spray booth, features pre-assembled construction and simplified maintenance. This paint spray booth provides suction of paint laden air at both the top and bottom of the water curtain.

Since paint-laden air is drawn into the Roto-Wash booth both over and under the water curtain simultaneously, a more even flow of air is created across the face of the booth. This traps the paint overspray in the spray-



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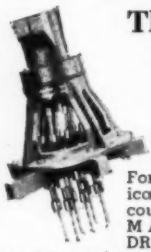

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Together, here's really low cost hot glue for you. Inquire for prices and capacities today.

½ to 11 qt. glue pots with removable inserts.

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ing area. It also permits a pre-wash of the air before it enters the washing section of the booth.

The washing principle employed in the booth is created by suction from the exhaust fan. The air passing over the water curtain is prewashed as it passes down the rear of the water curtain. Air passing under the water curtain is washed as it goes through the water cascading from the curtain into the tank. At this point the two streams of water and air join and are carried into the scrubbing torrent. As the spray-charged air stream passes through the Roto-Wash, its direction is reversed twice as it impinges against metal baffles. This results in a scrubbing action and drop collisions which trap paint particles in water. The paint-laden water settles as sludge in the tank below. The air then passes the moisture separator before entering the exhaust fan, clean and free of paint and water.

The booth is pre-assembled and factory-tested prior to shipment to the customer. The only installation operations necessary are the connection of water and electrical services and the exhaust stack. Complete details on the operation and installation are available from the Newcomb-Detroit Company, Dept. WD, 5741 Russell, Detroit 11, Mich.

It's all right to drink like a fish, providing you drink what a fish does.

HAND SANDER FOR CONTOURS

This hand sander will sand contoured, convex and irregular shapes as well as flat surfaces. Called Sand-O-Blok, it consists of a plastic wedge-shaped body. A rubber sleeve ranging in thickness from 1/16" to 3/16" wraps around the body and cushions the abrasive paper. By rotating the rubber sleeve around the wedge-shaped body, the radius at each end can be changed from a minimum radius of ⅛" at the narrow end to a maximum radius of ¾" at the opposite end. Any radius between these two limits can be ob-

CUTTERS, SHAPER, ROUTER JOINTER & CARVING

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ANTHE MACHINE WKS.—Covington, Ky.

44" vertical band resaw

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BRANDS QUICKLY EASILY PERMANENTLY

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For furniture, tires, movable equipment such as shovels and ladders, wooden shipping cases, tool handles and hundreds of other articles where permanent identification is desirable.
Send specifications for quotation.
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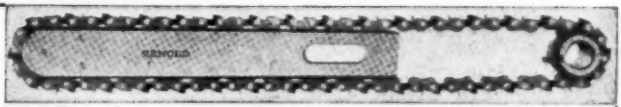
"Tool Up With Woodworkers"



DOES YOUR MORTISE EQUIPMENT MAKE A CLEAN, STRAIGHT CUT LIKE THIS?

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Fits any chain mortising machine. Renold mortise gear is made by specialists in the manufacture of transmission chains. It embodies the best design, finest skill in workmanship and these factors, combined with the specially selected steels employed, insure users of Renold gear the maximum results. Write for prices, advising kind of machine you have and size of mortise you wish to cut.

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220 South Jefferson St. Chicago 6, Ill.

IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

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ANSWER TO PUZZLE ON PAGE 107

To make the solid cube of the many small cubes, the joiner would have to apply glue to 300 faces. Any complicated assembly job is simplified when you use UFORMITE CB-553, since the resin disperses easily in water, spreads smoothly, and produces strong, durable bonds.

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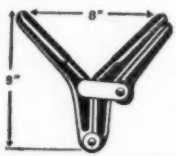
Style 60: Deep engagement clamps. Quick acting. Take the place of "C" clamps. Speedily adjusted

Style 5: For interior woodworking, body building, furniture, sash and door manufacture. Rigid action tail piece. Quickly adjusted.

32 Clamp Styles Available. Write for free Catalog Today.



No. 62 Mitre: Planed off jaws with hardened steel pins just long enough to hold work.

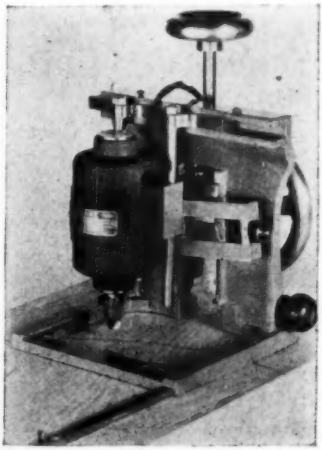
The HARTFORD CLAMP COMPANY EAST HARTFORD, CONN. Est. 1915

tained by this new patented principle.

Sand-O-Blok is a product of Merit Products, Inc., Los Angeles 27, Calif., makers of the Sand-O-Flex line of contour sanding wheels. Address their Dept. WD, for additional information.

COREBOX MACHINE AND ROUTER

By using a rail fashioned temporarily to the work, this router will slide lengthwise and across the work with ease. As a corebox machine, it will



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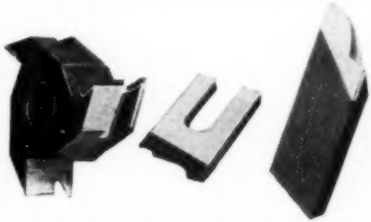

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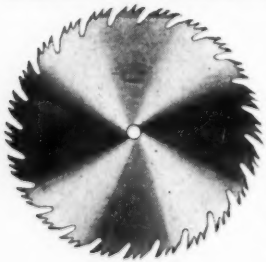
work out one-half circle and irregular shapes, ribs, bosses and flutes inside the box. From the pivot, it can be easily adjusted to any arc radius. Speed is 8000 R.P.M. under load. Arrangement is made for worm feed on close work and metal. The machine stands 9" high (excluding the screw handle). Further information on the router and core machine is available from Bjorklund Pattern Works, Dept. WD, 312 Erie Street S.E., Minneapolis 14, Minn.

ALL-PURPOSE FLOOR MACHINE

The new Tornado all-purpose floor machine incorporates all seven of the features which operators have found helpful and practical. These features include: rotary safety-grip switch, finger tip solution control, fully adjustable handle, self-raising wheels, automatic brush coupler, "Foam-Feed" brush design, and quick-change snap-on brush rings. All combine to give greater convenience and ease of operation, reduce fatigue, and therefore enable plant maintenance men to do more thorough work in far less time, save on maintenance costs, and provide cleanliness and sanitation quickly and easily, it is claimed.

An important exclusive feature is the new replaceable brush rings. Tornado brushes are made up of individual, con-

HEINEMANN



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HIGHEST QUALITY SAW BLADES

Excellent for all Radial Saws. Perfectly Balanced and Tensioned for High Speed.

Made from 10" to 24" Dia.

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centric bristle rings which may be replaced easily by any operator whenever the need arises. Only one metal brush back is required. The bristle rings are secured to the brush back by strong spring steel clamps and replacements or changes can be made quickly wherever the machine is at work.

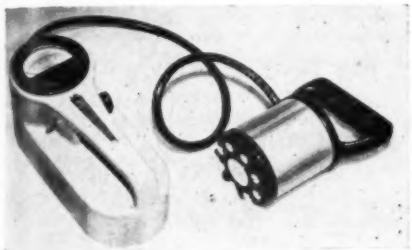
Complete details from Breuer Electric Mfg. Co., Dept. WD, 5100 Ravenswood Ave., Chicago 40, Ill.

MOISTURE REGISTERS

A new moisture testing instrument for use on lumber and wood products, an instrument with guaranteed accuracy from 0-25%, has been developed after 3 years of research by the Moisture Register Co., Alhambra, Calif.

As with other models, the Company is offering the new RF4 instrument on 10 days free trial. Several new features have been incorporated: oversize, spring-backed electrodes give instant, "all-over" contact for testing; there are no needles to drive, surfaces are not marred and rough and smooth surfaces can be tested with equal facility; the unit tests to a depth of 2" or more.

Details from the above Company, Dept. WD, 133 N. Garfield Ave.



DUSTBUSTER

High volume dust storage and high volume air suction are features claimed for a new, low cost bag type dust collector. Aget-Detroit Company says the unit can be used for sawdust, chips and shavings.

Dustbuster is offered as a complete

Prompt Delivery
Factory Trucks

Size 1
24" x 48"
Size 2
30" x 48"
Size 3
30" x 60"

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Jakes Foundry Co.

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LION Miter Masters

Precision Cutters

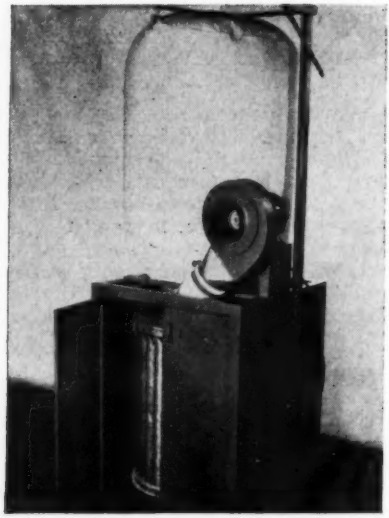
- Miters door, furniture trim; sash, screen, frames, casket work.
- Finest machining and fitting throughout.
- Gauge Stops for production runs.

Write for full Information.

Bench Model, $59.50; cuts 1¾" moulding. Foot powered model, $123.40; cuts 2¼" wide. Leaves hands free for aligning work.

Also, Lion Trimmer for finish trimming to any angle, $51.75. All prices F.O.B. Stratford.

POOTATUCK CORP. 14 Sammis Pl. Stratford, Conn.



unit with self-clearing paddle-wheel fan, driven by a 1/3 h.p. continuous duty, 3,600 r.p.m. motor. A galvanized, caster mounted trash can is enclosed in the housing that supports the blower and the filter. The discharge from the blower is through a canvas sleeve, clamped to a gasketed cover for the can, the filter being fastened to this same cover. Snap latches are used to secure the cover to can; springs support the cover while can is being emptied.

Operating rating of the Dustbuster, taken with a standard Alnor velometer: 633 c.f.m. on a 5″ inlet; this being equivalent to a 4,800 f.p.m. Other inlets are optional: double 3″, single 4″. If the motor is to be for operation on 220, 440, or 550 v., 3 phase, AC power, a small extra charge is made.

Aget-Detroit Company, Ann Arbor, Michigan.

BELT GRINDERS

A belt grinder, the Expeditor, which can be set at any angle, is mounted on an axis that centers at the motor shaft, and with one turn of a clamp nut

SCINTA
PORTABLE HAND SAW
Harowood 1½" thick doesn t even slow up the SCINTA Saw. Cuts Metal Too.
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the abrasive belt can be set at any angle. Several Expeditors can be set above each other so that the contact wheels or platens of the several may be directly in front of the operator. In this setup the worker can rough, semi-finish and finish grind with little movement.

It can be set alongside the metal or wood cutting bandsaws or hack saws to clean up tooth marks, round out contours and deburr; or close to the automatics to remove "tits", tool marks and other clean-up operations.

The front contact roll is made of aluminum, a drive belt serves as a resilient or cushion. Various densities are available. Resilient contact roll grinding, polishing or sanding is done at a lower cost for equipment is available from the manufacturers, Harvey L. Ramsey & Co., Dept. WD, La Grange, Ill.

Easy! watch this.

BELT SANDER

A 2-drum belt sander has been developed by the Mall Tool Company of Chicago. It can be used on all woods, metals and plastics.

It weighs 8½ lbs. and produces a ripple free finish on all surfaces. The belt sanding area is 3 x 5½ inches with replacement belts available for all types of material. Spring tensioning device makes various size belts, from 3 x 23¼ inches up to 3 x 24¾ inches,

Ⓗ HARGRAVE CLAMPS

Cut TIME & COST ON DOZENS OF JOBS

Get better clamping with Hargrave Wood Working Clamps . . . right for every joining job. Designed specifically for the wood worker, these quality clamps are easy-handling, quickly adjusted, with strong bodies and jaws, and practically indestructible threads. *Individually Tested.* Openings from ¾" to 12 ft., from ½" to 16" deep.

"C" Clamp (Openings ¾ in. to 18 in.)

Improved Spring Clamp (3 sizes)

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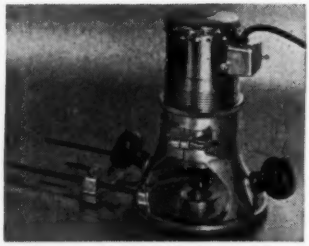

THE HURRICANE MODEL J-6

1¼ HP Portable Router, immediate delivery

$124.50 F.O.B. Chicago

Universal 110 volt AC-DC. 1¼ HP. Speed 18000 RPM Motor. Switch conveniently located. Air cooled—New Departure sealed ball bearings.

Outer housing high finished. Threaded and fitted with adjusting ring, allowing perfect depth control.

One ⅝" Template guide furnished, various lengths and diameters can be made on request.

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High Speed HANGER BOLT DRIVING . . .

A NEW, FAST OPERATION TIMED IN SECONDS!

This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. (It is not necessary to stop rotation at any time.)

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MANUFACTURERS OF

- LOG BANDS "that stand the feed"
- BAND RESAWS "that cut straight"
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Give Your Band Saw Operator A Treat

A millman 2000 miles away telephoned to see if we would recondition his old saws (other makes) "to cut like the new one" we had just made for him.

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BURTON STEEL HEAD BAND SAWS

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You step up your production with Supreme Knives . . . milled to exact specifications . . . to insure a perfect fit in the machine. Made from the correct alloy steel for your particular job, Supreme Knives work harder . . . longer. The expense of early re-sharpening and replacing is eliminated.

We design and make Special Knives to your requirements.

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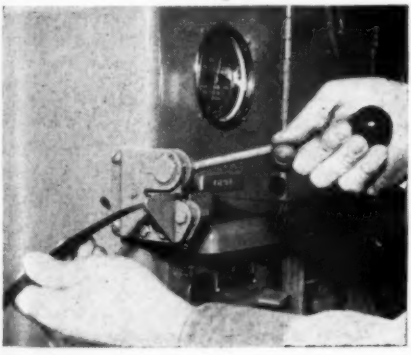
available for use on this tool.

A pedestal stand is available to convert the belt sander to a bench sander. In this position, the unit can even be used for sharpening chisels and knives, it is claimed.

For further information, write: Mall Tool Company, 7769 South Chicago Avenue, Chicago 19, Illinois.

BAND SAW BLADE SHEAR

An improved type of cam and lever actuated shear cuts off bandsaw blades square and flat in preparation for welding into a band. It will take blade sizes up to .045" thick and 1¼" in width. The new blade shear produces a smooth cut and the three hardened shear blades are easy to remove for sharpening. The shear can be mounted on the machine, nearby wall or bench. A piece of blade ⅛" wide is removed so that an old weld can be cut out in one operation, leaving the ends squared for a new weld.



Additional data may be obtained from the DoAll Co., Dept. WD, 254 N. Laurel Ave., Des Plaines, Ill.

1949 YEARBOOK

The Food and Agriculture Organization of the United Nations announces the 1949 Yearbook of Forest Products Statistics. Included in its 195 pages is a summary of conclusions, giving salient features of the 1948 world forest products situation. Charts and tables record production, export and import reports by over 100 countries and territories.

Food and Agriculture Organization of the United Nations, Washington, D. C.

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1800 Dixie Highway Hamilton, Ohio

UREA RESIN GLUE TESTS

An unextended mixture of urea resin glue makes a bond which resists deterioration almost completely over a period of 10 years, according to the findings from a series of long-term exposure tests just released by the Borden Co.'s Chemical Division. Samples of birch plywood were bonded with "Casco Resin No. 5," Borden's largest-selling liquid urea resin glue, in the experiment.

Since August 1939, the Division has kept samples of birch plywood, bonded with "Casco Resin No. 5" in three types of mixtures, in an unheated shed at its research laboratory in Bainbridge, New York. These samples have been subjected to prevailing temperatures, ranging from -15 to 90 degrees F., and to humidity from 20 to 90%. They have been protected only from rain, snow and direct sunlight.

The birch plywood specimens were: 1) bonded with an unextended mixture of the liquid resin glue, 2) a mixture with 50 parts rye flour extension; and 3) by the "separate application" method (where the uncatalyzed resin is spread on one surface of the wood joint and the catalyst on the other). Dry and wet shear tests have been made on matched specimens at intervals of 10 days, 2 years, 3½ years, 5 years, 7½ years.

The 10-year tests have just been completed. Deterioration of the glue line could be considered insignificant where the straight mixture of the liquid urea resin glue was used. The mixture with rye flour extension made the second-best showing. Deterioration was found to be the most pronounced in the case of the "separate application" catalyst.

CEE CLAMPS

New Cee clamps claimed to be made of the strongest cast aluminum alloy yet developed, are offered by the Foster Aluminum Alloy Products Corp. of Forestville 24, New York. They are equal in strength to malleable iron castings and are comparable in price,

but offer a number of advantages, the Company states.

The clamps are light and save up to 60% in weight, will not rust or corrode, are free of fire hazard caused by sparks and are spatter-proof in welding operations. A brass lead screw with double Acme thread operates smoothly in the aluminum casting. A sliding cross handle is convenient in applying maximum pressure without the use of tools. Literature with complete size and price data is now available for the manufacturer named above.

STANLEY ROUTER

Many woodworking operations, basic in furniture construction, can be done speedily and more accurately with the No. 28 Stanley router, we are told. Depth of cut is regulated by raising or lowering motor unit on the threaded motor casing. New ½ h.p. motor, 18,000 r.p.m., with oversize, sealed for life bearings and oversize shaft for smooth cutting and greater power. Oversize ventilating system keeps motor cool and work surface clean. Universal type motor supplied in all voltages. Operates on either DC or AC, 60 cycles or less.

Stanley Electric Tools, Dept. WD, New Britain, Conn.

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with assortment of bits

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"The Clamp Folks"

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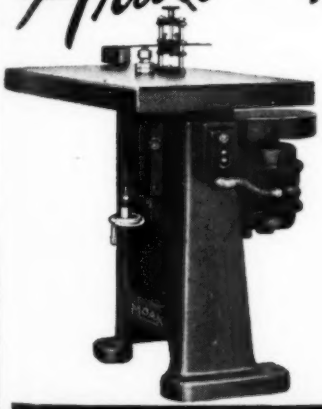
Mechanics Through The Ages

SO IGNORANT OF METAL WERE THE NATIVES OF TAHITI TWO CENTURIES AGO, THAT THEY BELIEVED NAILS WERE SHOOTS OF HARD WOOD THAT COULD BE INDUCED TO GROW! SO SOME NATIVES ACTUALLY PLANTED THE NAILS IN THEIR GARDENS.
KING GEORGE III OF ENGLAND WAS TRAINED AS A LATHE OPERATOR. HAD HE BEEN OBLIGED TO EARN HIS LIVING, HE WAS CAPABLE OF MAKING ABOUT 45 SHILLINGS A WEEK.
TO INDUCE RELUCTANT MANUFACTURERS TO USE THE REVOLUTIONARY STEAM ENGINE HE PERFECTED IN THE MID-1800'S, CORLISS TOOK HIS PAY OUT OF FUEL SAVINGS THE ENGINES AFFECTED. OVER A 5-YEAR PERIOD HE ONCE COLLECTED $19,734 FOR A STEAM ENGINE WORTH $7,000.

Artist in Wood
...and his Moak Single Spindle Shaper



Here's an artist who puts sales-appeal in wood fixtures. How? By a combination of two things: his skill and the consistent accuracy of his Moak Single Spindle Shaper.

Spindle speeds up to 12,000 rpm, high-speed bearings with positive lubrication, vertical motor on adjustable base—these are some of the features you get with a Moak Shaper. And with Moak Speedicut Shaper Cutters you can prepare special shapes at production-mill speed.

Write for details on Moak Shapers and Cutters today.

MOAK MACHINE & TOOL CO.
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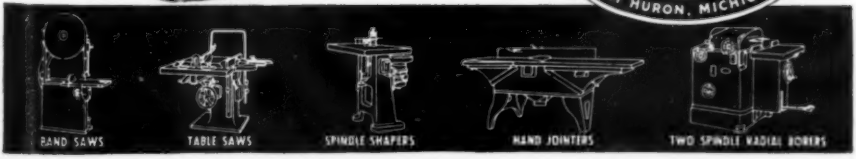

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STANDARD of COMPARISON
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Phone Mu. 7483

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Moulder—Woods, 12", four side machine.
Moulder—Yates C-4A, 8"—BMB.
Rip Saw—Yates G-2, BD.
Router—Porter No. 600
Sash Clamp—Fay & Egan
Spindle Carver—"Master" 18 spdles, ½ HP on each spdle., in excellent condition.
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Dowel Machine, No. 2 Hawker, motor driven.
Dowel Cutter & Pointer, motor driven
End matcher, (2) Stetson Ross, new
Lathe, Mattison 57D, 42" ball bearing, 10 h.p.m.
Moulder, Hermance 10", belt driven, with slip-on heads, 20 HP GE motor
Sander, Nash, 6 spindle No. 10, belt drive
Sander, 3 drum, roll feed, belt drive, 43"

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Boring machines, single vertical motor driven
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Conveyor belt 83' long x 16" x ⅜" thick.
Door clamp, foot power
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Hand Hole Machines
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Lock corner machines
Mortiser, chain, new, motor driven, $555.00.
Planer, Whitney 30" double, with new ball bearings in top and bottom heads, sectional double infeed rolls, flexible chip breakers, motor driven. Vee belt drive.
Planer, American No. 444, 30", motor driven, ball bearing, round head, sectional feed and chip breaker, grinding attachment
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Relishers, Door and Sash
Resaw, circular, rebuilt 30" ball bearing power fd.
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Routers, Portable, Floor Type and Stair
Sander, Mattison No. 427, hand block
Sanders, Pneumatic and Brush
Sash franking machine
Saw, Chain Feed Rip Defiance
Saw, Cut off, Double end, Chgo. No. 12
Saws, band, all sizes
Saws, Scroll, Ceiling and Self Contained
Saws, swing, self contained
Saws, Radial Arm.
Shaper, Whitney Douuble No. 39-A motors on arbors
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Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need, Also Air Compressors, Fans, Rotary Blowers, Money Savers—Send Specifications.

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Air Compressors, various sizes
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Borers, F&E No. 312 3 spindle vert. pb. bd.
Clamp, Taylor, 40 sect. 4 clamps
Dovetailer, Dodds 20 spindle BD.
Dowel Driver & Gluer, Bell No. 8 dmd.
Head Grinder, Berlin No. 137 md.
Head Grinder, Mattison No. 231, dmd.
Jointers, New Moak 12", bb. dmd.
Lathe, Mattison 57D bb. & motor
Mortiser, Sidney, single spindle pb. bd.
Mortiser, W & M No. 285—5 spdle. horiz. dmd.
Mortiser, W & M No. 288—6 spdle. horiz. dmd.
Moulder, Yates C88—8" bb. dmd.
Planer, Buss 44" Sgl. bb. dmd.
Planer, Fay 30" sq. hd. pb. bd.
Planer, Whitney 44" single rd. hd. bb. dmd.
Planers, Woods No. 450—30" dbl. pb. bd. & motor
Planers, new Crescent 24" bb. dmd.
Planers, F&E 30" sec. roll rd. head vee-belt & mtr.
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Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sander, Mattison No. 177 edge belt dmd.
Sander, New Jefferson, hand block, bb. dmd.
Sander, Smith 49" 3 drum endless bed, bd. with motors
Sander, Vonnegut, pneumatic bb. dmd.
Sanders, Columbia 3 drum, roll feed, vee-belt, motor drive
Sanders, F & E 60" 3 drum roll feed, dmd.
Sanders, Nash No. 25—10 spdle. dmd.
Sanders, Nash No. 40—6 spdle. dmd.
Sanders, Yates-Amer. No. 413—2 drum 49" endless dmd.
Saw, Beach, dbl./cutoff, pb. bd. & Motor
Saws, Amer. No. 9 Tilt arbor bb. dmd.
Saws, Jenkins 105—dbl. cutoff, bb. dmd.
Saws, Mattison No. 207 str. line, bb. dmd.
Saws, variety Y & F, tilt table pb. bd.
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Shapers, Defiance dbl. spdle bb. dmd.
Shaper, Greenlee No. 180 dbl. spdle. dmd.
Shapers, Beach single spindle, bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Shapers, Whitney dbl. spdle. bb. dmd.
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Sticker, sash & door, Hayes-plowing & boring attachment, bd.
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Tenoner, Greenlee No. 530 sgl. end with copes, bb. & motor
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Veneer Press, Black Bros. 4' x 7'
Woodworker, Crescent pb. bd.

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Planer,-matcher, 12"x6", Woods 40 HP.
Radial Saw, 5 HP DeWalt, 3-60 22[illegible]
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Mortiser, Wysong, No. 181, 5 spdle. hor. gang MD, $375
Moulder, F & E, 7 in., 4 side, $550
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Planer, Dennis, 30x6 sgl. cabinet heavy, $450
Resaw, Cordesman, 30 in. BB, circular, $550
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Saw, Walter-Turner, heavy duty, radial, $300
Saw, Table, 10", BB tilt, $60
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BEACH, 24' Single Drum Sander, B.D.
SANDER, Yates 431, 43", Belt dr., Endless bed.

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Sander, endless bed, Solem 2 drum 36"

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Also jointers from 12" to 30".

More than 150 machines to select from.

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SURPLUS

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American 2 spl. Hor. Radial M.D.
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Porter Hydramatic C. O. Saw
DeWalt 5 Hp., 3 ph.
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Greenlee No. 456 Auto. Railway C. O. 12" Cap.

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Fay & Egan No. 406 Dowel Machine

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Hall & Brown No. 134 Auto. C.O. & Dado

JOINTERS:
Yates No. 199 12" Rd. Hd. M.D.
American 16" No. 1 Incline Bed
Fay & Egan 24" Rd. Hd. No. 116
8" Speed Marvel Ball Br. M.D. New

LATHES: Mattison No. 57-B Automatic

MOULDERS:
Fay & Egan No. 184 12", 4 side
Hermance 10" 4 side, Bab. Br.
American 10" 4-side, No. 20
American 10" No. 26
Hermance 8", 4 side Bab. Br.
American No. 505 10" 4 side Bab. Br.
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New Britain No. 4 Chain Comp. with H.C. attach.
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Boice Crane No. 2006 oscil. Spindle Sander
Beach Mfg. 48" W.F. Disc Sander
American No. 15 24" sgl. dr. hand feed

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SHAPERS:
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Shimer No. 4 Sgl. Ball Br., M.D
Fay & Egan No 265 Db. Spl.
Oliver Sgl. Spl. No. 287 Ball Brg. Mtr. Dr. 95% New

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Yates-American No. G-67 Chain Fd. Straight Line Rip and Edging Saw, B.B., M.D.
Yates-American No. G-77 Chain Fd. Straight Line Rip and Edging Saw, Ballbearing, Motor Driven.
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Fay & Egan No. 110 Self Fd., 10 HP mtr., V-belt dr.
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Yates G-2 Chain Feed, 10 HP motor-on-arbor.

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8473	Blount Lathe
8520	Greenlee Borer
8522	Egan No. 1 Swing Saw
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8643	Weymouth Lathe Novelty
8654	Francis 12" Jointer
8666	Lathe
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8746	F&E Siding Saw
8750	Nash Boring Machine
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Band Saw, 20" Yates American, 1 HP motor
Band Saw, 36" H. & B. No. 120 B.D.
Band Saw Filer, Black Diamond M.D.
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Boring Machine, Andrews Vertical Multiple, 8 spindles with motor.
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Box Board Matcher, Hall & Brown No. 176 M.D.
Chucking Machine, Smith, 3 HP motor
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Dovetailer, Dodds 12-spindle, M.D.
Glue Spreader, 60" Francis Dbl.
Grinder, Knife, Auto. 30" Fay & Egan No. 253 Disk Wheel
Jointer, 24" Crescent, Belt Drive
Jointer 12" Hall & Brown with motor
Knife Grinder, auto Rogers style F-32"
Lathe, Auto. Berlin with heads, B.D.
Lathe, Propeller Fahlin 10' motor drive with wood patterns and jigs
Lathe, Waymouth, Automatic
Mortiser, Crescent Hollow Chisel, New
Moulder, Hall & Brown 12"—4 side belt drive
Moulder, 9" Rawley & Hermance with motor.
Moulder 9"—4 side Fay & Egan with motor
Nailing Machines, Doig 13 and 17 track, closed back
Planer, New Powermatic 12x4" M.D.
Planer, single 16x6" Powermatic, New
Planer, single 24x6 Northfield No. 5, New
Planer, single Crescent No. P-24—24 x 8 ball bearing, direct motor drive.
Planer, 12x4" Boice Crane No. 1002, New
Planer, Yates-American No. B-24—7½ HP
Radial Saw, Comet Clipper, 3 HP, New
Radial Saw, Comet Sr., 5 HP, New
Radial Saws, Multiplex 30A and 40A new.
Rip Saw, Chain Feed Mattison No. 205 M.D.
Router, Onsrud No. W-240D—5 HP late type
Router Yates-American No. U-90
Router & Borer, Radial Arm, Onsrud No. A1
Router, Duro floor model, M.D.
Router, Onsrud No. A1R Radial Arm
Sander, Crescent 18" Disc, New
Sander, Belt, Fay & Egan No. 553
Sander, Belt, Auto., Curtis 6'
Sander, Nash auto. belt for Bowling Pins
Saw, Cut-off, Yates-American Str. Line, 5 HP
Saw Table, American No. 20, Double Arbor
Saw Table, Crescent No. 3, double arbor
Saw, Swing, H. & A. No. 5—10", New
Saw, Swing, H. & A. No. 25—14", New
Saw, Swing, H. & A. No. 55—16", New
Saw, Variety, Hall & Brown No. 131 with motor
Shaper, American No. 20 with 2—5 HP motors
Shaper, sgl. spdl. Ekstrom-Carlson No. 162 D.M.D.
Tenoner, Fay & Egan No. 505 with one cope M.D.

Send us your inquiries for machines not listed.

McDONALD MACHINERY CO.

1531-35 N. BROADWAY PHONE CENTRAL 9360 **ST. LOUIS 6, MO.**

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BIG VALUES

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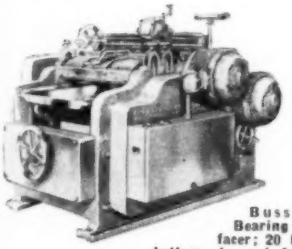
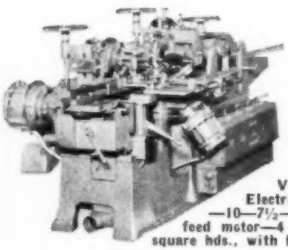
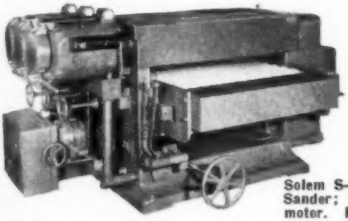


Buss 8-A 30" Ball Bearing Double Surfacer; 20 HP top, 15 HP bottom, 4-speed feed motor, sectional rolls and chip breaker. Grinding equipment. Rebuilt.



Vonnegut 6" Electric Moulder; 10—10—7½—5 HP—4/2 HP feed motor—4 knife round or square hds., with hopper. Rebuilt.



Solem S—3—M—49" Three Drum Endless Bed Sander; 7½ HP drum motors — 3 HP feed motor. Rebuilt and guaranteed.

These are representative items from our half-million dollar stock. They are late model machines and are available at substantial savings.

- Greenlee 370 — 100" Horiz. Mult. Borer
- St. Paul 24 Sp. Auto. Carver
- Union No. 31 — 60" Dbl. Roll Spreader
- Jenkins 3CD Glue Jointer
- Mattison 57-F Auto. Turning Lathe
- Woods 132-BM — 10" Five Head Elec. Moulder
- Yates-American B-7 Six Roll Single Planer
- Oliver 36" Straitoplane
- Onsrud W-265 High Speed Router
- Curtis 8-B Semi-Auto. Belt Sander
- Mattison 124 Auto. Stroke Sander
- Nash 25 Auto. Turning Sander
- Jenkins 105-A Dbl. Cut-Off Saw
- Mattison 207 Straight Line Ripsaw
- Onsrud W-200 Sgle. Sp. Shaper
- Greenlee 180 Dbl. Sp. Shaper
- Francis 30" x 72" Hydr. Veneer Press
- Dodds 12 - 15 - 20 Sp. Dovetailers

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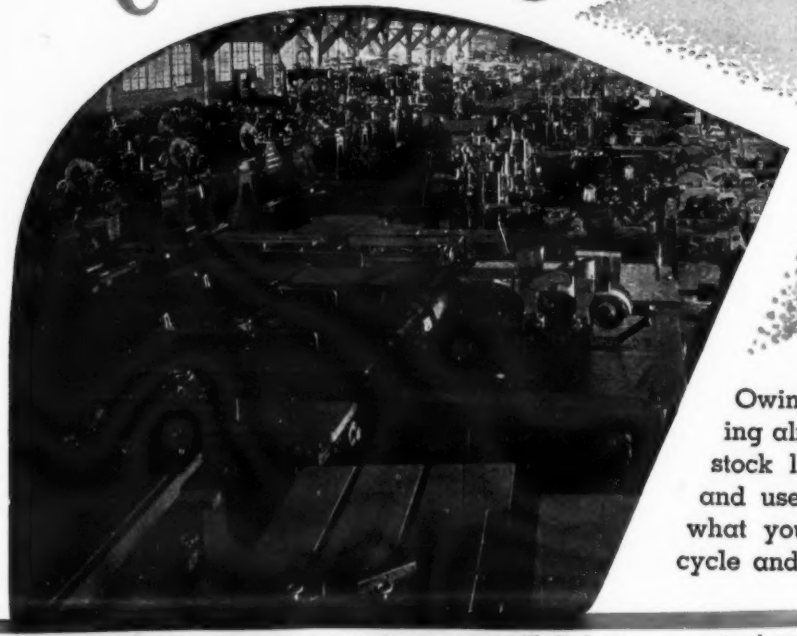

Owing to our very large stock changing almost daily, we are omitting our stock list. We have about 350 new and used machines. Tell us exactly what you want, and advise phase, cycle and voltage of your current.

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anteed and must be satisfactory, as our users are the judges. Whether your machines require

cycle and voltage of your current.

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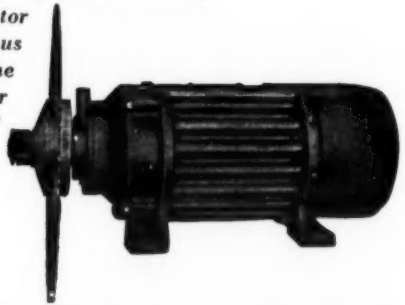
Modern production and rebuilding methods employed at O & S provide further assurance that the equipment which we literally "remanufacture and assemble" will meet your exacting demands. Every machine rebuilt or sold is guaranteed and must be satisfactory, as our users are the judges. Whether your machines require rebuilding, or you need machinery to help you meet the competitive situations which are ahead, be sure to contact Osborne & Sexton in Columbus. You will find a friendly organization . . . capable and willing to work with you on your engineering and production problems. Write us today.

MOTORS Totally enclosed, dust proof, fan cooled, ball bearing saw arbor motors, 3600 r.p.m. From 1 h.p. to 15 h.p. Measures only 3¼" from center of motor shaft to flatted top. Thus facilitating the use of the smallest possible diameter saw blade. (2, 3 & 5 HP motors available for quick shipment.)



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Band Saw, Tannewitz "GH", 36", ballb., mtr.
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Borer, horiz., Andrew 42", 3-spdl., mtr.
Borer, horiz. Oliver No. 71, 2-spdl. radial.
Blower, Garden City 35", ball bearing.
Blower System, blower, motor, cyclone, pipe.
Chucking Machine, McKnight, foot-feed.
Clamp, 2-Way, Handy No. 35.
Door Clamps (2), power and foot operated.
Dovetailer, Dodds, 15-spindle.
Dowel Cutter and Pointer, Bell No. 3.
Dowel Machine, Hawker No. 2, ball bearing.
Dowel Gluer & Driver, Bell No. 8, mtr.
End Matcher, Sherman Style B.
Glue jointer, ballb., Linderman.
Hand-Hole machine, Woodworker's, ball bearing.
Jointer, 20", F. & E., ball bearing.
Jointer, 24", American, Billstrom feeder.
Jointer with power feed, Oliver No. 122-D, 30", 4-kn. rd. cyl., 3 mtrs., elec. grinder.
Lathe, autom., Imperial 31", 10 h.p., ballb.
Lock corner cutter, double end, B. & M.
Mortiser, chain-saw, New Britain, No. 3.
Mortiser, h.c., vert., Yates-Am. No. 20, mtrs.
Moulder, elec., Mattison No. 229, 8"-freq.-changer.
Moulder, elec., Vonnegut 12".
Moulder, 4-side, Hall & Brown, 8", mtr.
Moulder, 4-s., Smith 6", ballb., mtr.
Nailer-Cleater, Morgan No. 8, motor.
Planers, sgl., 12", 16" and 20".
Planer, dbl., Yates No. 177, ballb., 30"x12".
Planer, facing, Oliver No. 122-D, 30", 3 motors, electric grinder.
Ripsaw, self-feed, Sinker-Davis, mtr.
Ripsaw, ballb., Yates-Am. No. 40, chain-fd., mtr.
Router, elec., Porter No. 612, 3 h.p.
Sander, horiz., edge belt, Indiana, ballb.
Sander, edge moulding, Roth No. 99, motor.
Sander, autom., Lincoln 8-spindle.
Sander, 3-dr., Berlin 30", 4 motors.
Sander, 3-dr., roll-fd., F. & E. No. 225, 42".
Sander, 2-drum, e.b., Yates No. 413, 31", motors.
Saw, tilt arbor, Whitney, ballb.
Saw, autom., cut-off, foot-fd., Smith No. 343-B.
Shaper, 2-spdl., Porter No. 201 SVM, two 5 h.p. vert. belted motors.
Sticker, Williamsport, pl. & bor. attachm.
Tenoner, sgl.-end, Powermatic, ballb. copes & cut-off saw.
Woodworker, combination, Parks, ballb., comprising bandsaw, ripsaw, jointer, swingsaw, mortiser, shaper, disc sander and tenoner.

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Tannewitz PH—30", D.M.D.
Tannewitz GH 36", D.M.D.
American B-36, 36"
Tannewitz R-42, D.M.D.
Jones-Superior No. 155, 42", M.D.

BORERS
Root "GM" Vert., Single Spdl.
Root "CH" 6' Hyd. Univ. Multiple
Fay & Egan No. 312, 42" Vert. Multiple
Towsley 2 Sp. Horiz., Radial

CLAMPS
Bell 70-B Air Door Clamp
Lancaster No. 400B Air Frame Clamp
Lancaster No. 500 Air End Clamp

CLAMP CARRIERS
Taylor 6½', 30-Section
Taylor 7½', 40-Section
Taylor 10', 60-Section

DOVETAILER
Dodds 12-Sp.

FANS
Sturtevant 50" Single

FREQUENCY SET
G.E. 5 K.W.

GLUERS
Bell 72" Plate Edge Gluer
Francis 8" Gluing Machine

JOINTERS
6", 8", 12", 16", 20" sizes
Porter No. 300 GM 24" D.M.D.

LATHES
Mattison No. 57-D 42" Auto.
Reed 16" Turning Lathe, 16" Swing

MORTISERS
Creseent Vert. Motor driven
Loeffler No. 610 Hi-Speed
Wysong & Miles No. 181, 6-Spindle
American No. 10 Sash Mortiser & Relisher

MOULDERS
Woods 2½" Electric No. 807M4
American 6" and 8" 4-Side
Amer. No. 1, 4" Single Head

NAILING MACHINE
Morgan 12-Track

PLANERS
24", 30", and 36" single
Yates No. 156, 30" single, B.B.

ROUTERS
Onsrud W-265 Electric
Onsrud W-113 Air

SANDERS
Yates No. 431, 43" Endless Bed, 3-dr.
Amer. No. 2, 43" roll feed, 3-dr.
Curtis No. 11 Semi-Auto. Belt Sander
Nash No. 65 Automatic Turning
Wysong & Miles 16" Disc Sander

SAWS—CUT-OFF
Porter, Floor Type
Y-A G-44 Floor Type—with table
Bell No. 12 Double Miter
Mereen-Johnson No. 435, Multiple
Monarch X36-AE Radial

SAWS—CHAIN FEED
Mattison No. 205, Ball Berg., D.M.D.
American No. 15 Ball Brg., D.M.D.
American No. 40, Motor Driven

SAWS—Self-Feed
Hermance No. 31
American No. 1
Greenlee No. 426

SAW TABLES
Root and American
American Dbl. Revol. Arbor
American No. 7½ Comb. & Dado
Tannewitz SJ Tilting Arbor

SHAPERS
American Single Spindle

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FADER (Fād'er) n. synonym for quality, intelligent service and understanding of the needs of woodworking plants. Also means economy in the purchase of equipment.

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BAND SAWS
Superior 36", steel spoked, motor driven
Superior 42", ballbearing, motor driven
American 36", ballbearing, motor driven

BORERS
Root, Style CX, 6' Vert., 12 spdls., BB. D.M.D.
Greenlee No. 369, 3' Vert. Multi-Spdl., D.M.D.
Greenlee No. 369, 4' Vert. Multi-Spdl., D.M.D.
McKnight No. 211, 2-Spdl., Vert., Angle Borer, B.B., D.M.D.
Pringle & Brodie 6 spdl., adj. vert., M.D. pwr fd.
Valley City, 2-spdl., adj. radial, motor driven
American 2-spdl., adj., radial, motor driven
American Sgl. Spdl, horizontal, motor driven
Bell 3-spdl., adj., horizontal, M.D. Power Feed
Wysong & Miles No. 283B, Sgl. Spdl. Vert., B.B. D.M.D. (Like New)

CLAMPS—ASSEMBLY
Bell Chair Assembly, Air Operated (like new)
Handy Mitre Clamp, 20"x26" maximum

CLAMP CARRIERS
Bilistrom, 29-sec., 6½ ft. wide, 38" clamps per sec.
Handy 18-sec., 5 ft. wide, 38" clamps per sec.

DOVETAILERS
Dodds, 15-spdl. motor driven, spiral gears

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Bell No. 4-A capacity ¼"-2", M.D., B.B.
Hawker No. 2, capacity ¼"-2", M.D., B.B.
Nash No. 4 Dowel Rod Sander, motor driven

FACERS
Bilistrom 28" Swing-Out Type Jointer-Feeder

GLUE SPREADERS
Bell No. 9, 72" Flat Plate Gluer

JOINTERS
Fay & Egan No. 217, Continuous Chain Feed
Jenkins-Falls, Continuous Chain Feed, M.D.
Porter 16" Round Head, D.M.D.
Superior 16", Round Head, B.B., M.D.
American 12", Round Head, motor driven
Superior 12", Round Head, motor driven

JIG SAWS
Oliver No. 173 Self-contained, D.M.D.
Superior, Self-contained, motor driven

MORTISERS
Greenlee No. 228 Vert., Hollow Chisel, M.D.

MOULDERS
Yates-American No. C-99, 6", 4-side, D.M.D. B.B. Electric, Hopper Feed, Freq. Changer
Mattison No. 229, 10", 4-side, D.M.D., B.B., Elec.
Houston, 10", 4-side

PLANERS
Whitney No. 24, 30" Double Cabinet, B.B. D.M.D.
Buss No. 4-A, 26", Sgl. Cabinet, B.B. D.M.D.
Buss No. 4, 30", sgl. cabinet, D.M.D., B.B.
L. Power 24"x 6" Planer-Matcher, motor driven
Yates No. 156, 26", single, motor driven
American No. 112, 30" single, motor driven

ROUTERS
Ekstrom-Carlson No. 126 Hi-Speed, B.B., D.M.D.
Porter No. 500, B.B., Direct motor driven
Porter No. 502, 2-spdl., B.B., D.M.D.

SANDERS
43" H.B. Smith, 3-Drum Endless Bed, D.M.D.
American 31", 2-drum, Roll Feed, M.D.
Curtis 8' Automatic Stroke, motor driven
American No. 2, 24" Disc and Oscillating Spdl.
American No. 5 Drum Sander, D.M.D.
Nash No. 4 Round Stock and Dowel Sander

SHAPERS
Yates N-4, Sgl. Spdl, High Speed, B.B., D.M.D.
Porter, Sgl. Spdl., high speed, B.B., M.D.
Whitney No. 34, Dbl. Spdl, B.B., D.M.D.

SAWS—CUT-OFF
Diehl No. 88 Fl. Type, Str. Line, B.B., D.M.D.
Porter, Floor Type, Straight Line, B.B., D.M.D.
Hayes 60", Chain Feed, Dbl. Cut-off B.B. D.M.D.

SAWS—RIP
American No. 40 Chain Feed, B.B., D.M.D.
American No. 15 Chain Feed, motor driven
G. M. Diehl No. 75 Chain Feed, B.B., D.M.D.
Fay & Egan No. 264 Self Feed, D.M.D.
Yates No. 257 Gang Rip, M.D.

SAWS—VARIETY
Tannewitz Type J, Tilt Arbor, B.B., D.M.D.
Pettingell, Tilt Arbor, Roller Table, M.D.
Tannewitz, Tilting Table, motor driven

TENONERS
McKnight No. 71C Chair Back Tenoner, M.D.
Greenlee No. 535 Saw Tenoner, All-Electric
Towsley Single End, Tenon heads, lower cope, cut off saw, motor driven

VENEER MACHINERY
Francis 36"x72" Hydraulic Press
Dennis Taping Machine, motor driven
Dennis Continuous Feed Veneer Jointer, mtr. driven
Jenkins-Falls Veneer Jointer, B.B., motor driven
G.M. Diehl No. 89, Tapeless Veneer Splicer, M.D.
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Zoller Power Mitre Chopper, motor driven
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McKnight No. 25 side rail fitting mach. b.d.
Fay & Egan No. 312 4 sp. vertical b.d.
Pratt & Whitney 16-sp. Univ. vertical, m.d.
Towsley 2 sp. radial

CARVERS
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Porter sing. sp. ball brg. m.d.

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Delta miter chop saw, ball brg. m.d.
Yates-American G-44 cut-off ball brg. m.d.
Porter straight-line cut-off, ball brg. m.d.
Fay & Egan No. 700 straight-line cut-off ball brg. m.d.
Towsley hanging type swing saw, m.d.

JOINTERS
Colladay 16" jointer, b.d.
Porter 12-in. ball brg. m.d.
American 16-in. with Billstrom feeder, b.d.
Oliver 16-in. Jointer ball brg. b.d.
Sidney 16-in. Jointer ball brg. b.d.

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Mattison No. 55-C, 30-in. ball brg. m.d. Turning
Mattison No. 57-B, 42-in. b.d.
Yates No. 74 automatic Turning, ball brg. b.d.

MORTISER
Powermatic Chain, m.d. new
American No. 20 Hollow-Chisel, b.d.
Greenlee No. 228, m.d.

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Mattison No. 262 6-in. ball brg. elec.
Mattison No. 276 6-in. elec.
Yates-American No. C-75, 6 & 8-in. ball brg., elec.
American No. 1, 6-in. 4 sided, b.d.
Smith No. 141A sticker, 3 sided, with plowing & boring attachment

PLANERS
Whitney No. 32, 30-in. ball brg. m.d. single
Fay & Egan No. 156, 36-in. ball brg. m.d.
American 24-in. b.d.
Oliver 24-in. single, b.d.

ROUTERS
Onsrud 113-E elec. freq. changer
Yates Amer. No. W-900 m.d.
Porter No. 666, m.d.

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Schipper sp. ball brg. b.d.
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Wysong & Miles No. 303 Comb. disc & sp. ball brg. m.d. new
Yates No. 431, 43-in. 3 drum endless bed m.d.
American No. 11, 14-in. horiz. Box, b.d.
Peerless 20-in. Box b.d.

SAWS
Moak No. 16A ball brg. tilt-top
Tannewitz No. F ball brg. tilt-top
Fay & Egan No. 402 revolv. arbor sliding top, b.d.
Sidney tilt-top, b.d.
Tidey Saw rolling carriage, ball brg.

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CLAMPS: Bell Air Operated, high jaw, drawer, 48" capacity, new
Handy, High Jaw, Drawer, 64" capacity
CLAMP CARRIERS: Billstrom 29-section, 6' 6" capacity
Taylor 30 section; 6' 6" cap., air operated
Billstrom 39 section, 7' 6" capacity
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Herzog 30" feeder, mtr. driven, ball brg., power hoist, direct motor driven jointer
Smith 24" Feeder, motor driven, with ball bearing 4 knife rd. hd. jointer, direct coupled dr.
LATHES: Mattison No. 57-D Auto. Turning, M.D.
Smith B-42 B.B. automatic Turning Lathe, M.D.
PLANERS: Dennis 26"x7" Single, Cabinet, plain bearing, 4-knife round hd., V belt motorized
Sidney 24"x8" single, ballbearing, direct motor driven
REDRIER: Merritt 36"x72", 6-plate, motor driven
SANDERS: Yates S-2, Osc. Edge Belt, Motorized
Wysong & Miles No. 274 Combination Horizontal & Vertical Edge Belt, motor driven
SAWS: Tannewitz Type RH, 42" Band Saw, d.m.d.
Crescent 36" band saw, D.M.D.
Bell No. 216 Swing Cut-off Saw, direct motor driven, with two 10' roller tables
Buss Variety Saw, tilting table, B.B. direct motor driven
F & E No. 999 Straight Line Rip Saw, direct motor driven, with separate feed motor
Diehl No. 44 Straight Line Rip Saw, direct motor driven, with separate feed motor
Diehl No. 75 Straight Line Rip Saw, direct motor driven, with separate feed motor
SHAPERS: Sidney Single Spindle, ball bearing, motorized
Buss 2-spindle, ball bearing, motorized
Onsrud W 226 Buck Shaper, B.B. Direct motor driven
Sidney 2 Spindle, Ball bearing, motorized
Smith 2-spindle, ball bearing, motorized
TENONER: Hermance No. 2, upper and lower cope heads, direct coupled drive
WOODWORKER: Ball Bearing, 22" Band Saw, Reversible Shaper, 12" Round Head Jointer, Trim Saw, Cut-off Saw
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Tannewitz—Greenlee—American—Crescent—Moak 36" BB M.D.
Yates-American 36" BB M.D.
Superior 36" V-belt M.D.
American 42" V-belt M.D.
Tannewitz 42" M.D.

BAND RIP AND RESAWS
Yates No. 312 44" chain-feed hand rip
Newman No. 117 circular resaw BB M.D.

BORING MACHINES
Greenlee No. 386-C 8-ft. 12 spindle, M.D.
Root 5-ft. Style "C" 8-spindle universal, m-d.
Greenlee No. 363 6-spindle universal M.D.
New Wysong & Miles sgle. spdle., vert. d.m.d.
Y-A U-12 single-spindle, vertical, direct m.d.
Greenlee No. 356 single-spdle. vert., d.m.d.
Andrew single-spindle vertical, M.D.
Greenlee 36-in. No. 369 vert. gang, 8-spd., m.d.
Root "B-M" 16-spindle, cluster hd., motor-dr.
Valley City 2-spindle radial.

BLOWERS AND FANS
American No. 80E with 40-h.p. coupled motor.
Sturtevant No. 60 BB, 50-h.p. motor.

CLAMPS—GLUE ROOM EQUIPMENT
Taylor 6-ft. 12-sec. wheel type clamp carrier.
Black Bros. 10' 50-sec. power feed
Francis 38-in. double glue spreader.
Black Bros. No. 22D 26" dble. resin spreader
Greenlee No. 599 frame and furniture clamp

CHAIR MACHINERY
McKnight No. 49 dble.-end saw and chuck mach.
McKnight No. 87 2-head chucking machine, hand-feed, belt-drive.
McKnight No 26-F dble. end saw & bor. mach.
McKnight chair back tenoner.
McKnight No. 25 side rail frame boring machine

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Carter Type TR—Porter No. 600—Ekstrom-Carlson No. 24—Onsrud Type A4RR 2-spindle radial—M.D.

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Whitney No. 182, sgl., D. M.D., 56x40" table
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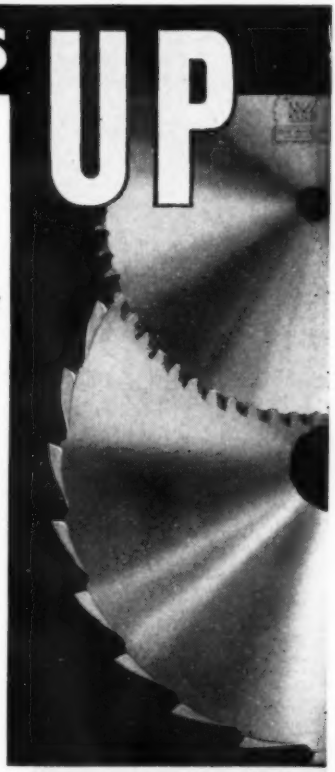

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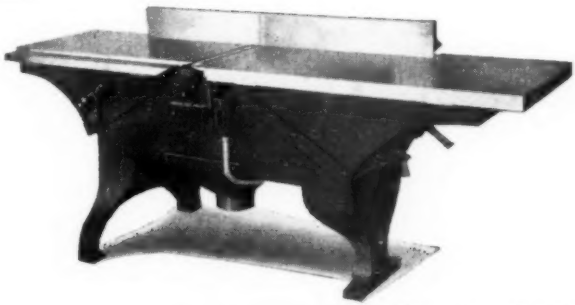

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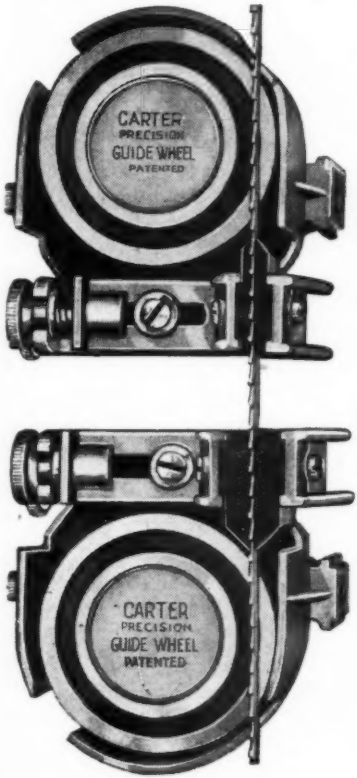

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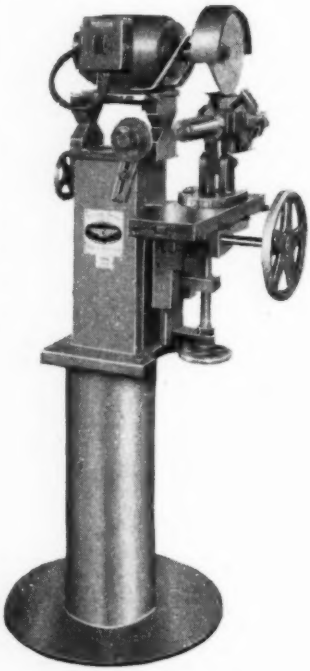

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FABRICS AND PAPER

with
SPOT-TACKS
Sizes: ⅛" to ⅜"

Automatic Magazine Feed Machines

The Spotnails Automatic *Magazine Feed* Machines do a better job—faster and cheaper. Call your local Spotnails representative or write for complete information regarding your specific requirements.

SPOTNAILS, INC.
Evanston 1, Illinois

MATTISON *NEW 303* "Delivers the Goods"

SAYS: ALGOMA PLYWOOD AND VENEER CO.

ALGOMA PLYWOOD & VENEER COMPANY
Algoma, Wisconsin
A DIVISION OF
UNITED STATES PLYWOOD CORPORATION

April 24, 1950

Mattison Machine Works
Rockford, Illinois

Attention: Mr. W. C. Hagstrom

Dear Mr. Hagstrom:

Your Mattison #303 Automatic Stroke Sander has been operating in our plant for the past six weeks, and every day we become more and more enthused about it. We have tried it on all of the various types of plywood and doors we manufacture, using all stroke lengths both long and short. The results are very gratifying.

Production from this machine is very close to 25% better than the Mechanical Type Stroke Sander, and this increased production is accomplished with less effort and less fatigue to the operator.

The mechanical simplicity of this unit with its minimum amount of moving parts will certainly reduce the routine maintenance cost.

After all a machine will produce only the amount of work it is given by the operator. With all controls at his finger-tips, with a delicate balance in the pressure handle, with consistent reversal of stroke, and with the high speed of the belt he cannot help but "deliver the goods".

Our present operator, one of our oldtimers who has operated all types of belt and stroke sanders, says that it is tops. In fact all of our belt sander operators, and we have several, have tried it and feel the same way.

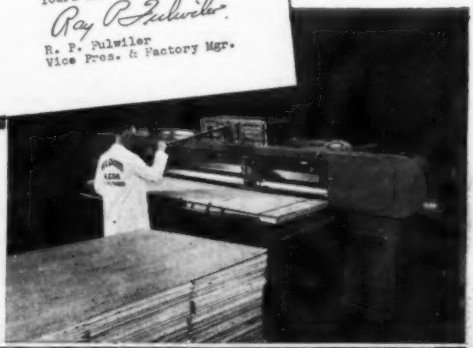
We have already recommended this machine to several of our other manufacturing plants and also some of our competitors. Streamlined in appearance, simple in construction, efficient and easy in operation, it should make a lot of good friends in the woodworking industry.

Yours sincerely,

Ray P. Fulwiler

R. P. Fulwiler
Vice Pres. & Factory Mgr.

RPF:hd



Mr. Fulwiler of Algoma Plywood, with many years experience in wood finishing and various types of sanders, sent us this letter regarding the results obtained from the Mattison 303 Automatic Stroke Sander in their plant.

The facts brought out by Mr. Fulwiler suggests that the 303 may do as much for you. For further information ask for a copy of our new free circular.

MATTISON MACHINE WORKS
ROCKFORD · ILLINOIS